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**DETERMINANTS AND FINANCIAL CONSEQUENCES OF
THE METHOD OF PAYMENT IN CORPORATE
ACQUISITIONS**

By

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Submitted for the degree of
Doctor of Philosophy

City University, London

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Department of Business Studies**

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To my father and the memory of my mother

Declaration.

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Abstract.

Although wide variation in the type of consideration offered in corporate acquisitions is observed in practice, little is known about how bidders or targets choose the method of payment in takeovers. Further, several empirical studies report that shareholders of both targets and bidders earn higher returns in cash offers than in equity offers, but the reasons for this more favourable impact of cash offers have not been empirically established.

This study attempts to fill these gaps in the literature by addressing three research questions:-

- 1) What factors determine the method of payment used by bidders in corporate acquisitions?
- 2) How do target shareholders choose between cash and equity when the bidder has offered "equity with a cash alternative" as the method of payment?
- 3) Why are bid premia higher in cash offers than in equity offers?

In examining how bidders choose the method of payment this study in contrast to all previous studies, emphasises that there is a simultaneous and joint relationship between the method of payment and the choice of accounting policy. Accordingly, we adopt a simultaneous equations framework with payment method and accounting policy choices as endogenous variables. Our results show that payment method has a significant impact on accounting policy choice whereas the reciprocal effect is not significant. This result reflects the fact that UK accounting rules have eroded the distinction between merger and acquisition accounting which is more clearly observed in the US.

We study how target shareholders choose the payment currency by examining how a choice is made between cash and equity when the bidder has offered "equity with a cash alternative" as the method of payment. We find that information about the opportunities for realising synergies in the acquisition have no influence on the choice of payment method by target shareholders. The choice is based primarily on the difference in value between the cash and equity offers. This is consistent with the theoretical predictions based on the efficient market hypothesis, that all publicly available information about a security can be reduced into a single index, namely the share price.

We tested some of the popular explanations which have been advanced in the literature to explain the higher returns to cash offers. The capital gains tax compensation and the wealth redistribution hypotheses are rejected. Information asymmetry between managers and shareholders can explain some of the higher returns observed in cash offers. This is consistent with signalling models which predict that the use of equity to finance investments signals a belief by managers that their shares are overvalued.

CHAPTER 1.

OBJECTIVES AND OUTLINE OF THE THESIS.

1.1. Introduction

While there is still an unresolved controversy on whether corporate acquisitions are a good or bad phenomenon, it is unarguably true that takeovers have now become an integral part of the Anglo-Saxon economic environment. In recognition of the importance of takeovers as part of the economic landscape, a significant amount of academic research in financial economics, industrial economics, organisational theory etc has been devoted to the study of the causes and consequences of corporate acquisitions.

Research over the last twenty years has made substantial progress in enhancing our understanding of corporate acquisitions. Academic research into takeovers has established some well documented and fairly robust results:-

1) Shareholders in target firms gain significant returns in the immediate period surrounding the announcement of the takeover (Jensen & Ruback, 1983; Jarrell, Brickley & Netter, 1988).

2) Returns to the target shareholders are higher in hostile bids than in friendly bids (Franks & Harris, 1989).

3) Returns to the target shareholders are higher in bids where there are multiple bidders than in bids with a single bidder (Bradley, Desai & Kim, 1988; Franks & Harris,

1989).

4) Shareholder returns are higher in cash offers than in equity offers for both targets and bidders (Franks, Harris & Mayer, 1988).

Despite the large amount of published research on corporate acquisitions there are still gaps in our understanding of the causes and consequences of corporate takeovers. In particular the role of the method of payment in corporate acquisitions and its impact on the wealth of shareholders in participating firms are not very well understood.

Despite the documented result that the returns to the shareholders of both the bidder and the target are higher in acquisitions where the method of payment is cash than in takeovers where the payment currency is equity (see Table 7.1 and 7.2 in Chapter 7 below) the source of this higher return to cash offers has not yet been identified. A number of theoretical arguments based on capital gains tax, information asymmetry, transfer of wealth from shareholders to bondholders have been proposed to explain the higher returns to cash offers, but empirical evidence on these theories is minimal.

1.2. Choice of payment method in corporate acquisitions

Although there are wide variations in the types of consideration offered in corporate acquisitions¹ very

¹Franks et al (1988) document in respect of US and UK acquisitions details of the different forms of consideration offered, the importance of each form and trends over the 30 year period 1955 - 1985.

little is known about how the choice of payment currency in takeovers is made by bidders.

One of the principal benefits from studying how the method of payment is chosen in takeovers is that it can potentially contribute to the debate on whether firms have any systematic preference for the means of financing investments. In Modigliani & Miller's (1958), no-tax, perfect market environment, firms should be indifferent to the means by which investments are financed. With the introduction of taxes and market imperfections (Modigliani & Miller, 1963; Miller, 1977; Myers, 1977; Ross, 1977) the relationship between financing decisions and the value of the firm becomes ambiguous. An understanding of any systematic financing preferences which managers have with regard to their investment decisions can help us in explaining the resultant capital structure of the firm.

Unfortunately it is difficult to test empirically, any preferences which managers have for the means of financing project type investments, since information on the financing of individual projects is not publicly available. However, a corporate acquisition represents a unique occasion, where the means of financing an investment is publicly disclosed. Accordingly, in this thesis, we seek to understand the factors which determine the method of payment in corporate acquisitions.

Conventional finance theory provides that new projects must provide a rate of return which is greater than their risk adjusted cost of capital where the cost of

capital is a weighted average of the cost of debt and the cost of equity (Copeland & Weston, 1983: Chapter 12). This implies that acceptance of new projects which influences the growth rate of the firm is dependent on the proportions of debt and equity used in financing the projects. In seeking to explain the choice between equity and debt, a great deal of the existing literature has focused on the capital structure of the whole firm (Harris & Raviv, 1991). Yet if given their individual characteristics, projects are financed by a mix of debt and equity which is appropriate for each project then the capital structure of the whole firm would represent an average of the capital structure of the firm's portfolio of projects. This implies that a greater understanding of the financing decisions of firms can be gained by studying the financing of individual projects rather than the capital structure of the whole firm which inherently masks a variety of different capital structure decisions. We believe that the empirical evidence which we provide can strengthen our understanding of those factors which influence the way projects are financed by firms thereby helping to improve the financial management and capital budgeting decisions of managers.

There is some theoretical literature which has examined acquisition financing, but this has been mainly concerned with the role of taxes and information asymmetry as determinants of the method of payment (Hansen, 1987; Eckbo, Giammarino & Heinkel, 1990; Myers & Majluf, 1984; Niden, 1988; Berkovitch & Narayanan, 1990).

1.2.1. Capital Gains Tax (CGT) and acquisition financing

The principal effect of taxes in an acquisition is the possible crystallisation of CGT liability. In a cash offer, the target shareholders are liable for immediate payment of CGT on any gains realised on the sale of their shares to the bidder. This tax is levied on the difference between the price paid by the bidder for the target's shares and the shareholder's original cost. In an equity offer the target shareholders can defer the realisation of any CGT until the subsequent disposal of the shares received from the bidder.

The ability in an equity offer to defer the realisation of gains until a future date reduces the present value of the CGT liability relative to that in a cash offer. In an efficient market, the higher CGT liability in a cash offer would result in target shareholders demanding compensation from the bidder in the form of a higher bid premium. Bidders wishing to avoid paying this higher premium would be obliged to offer equity as the method of payment. Niden (1988) and Higson (1990a) found no evidence to support the argument that CGT affects the method of financing acquisitions.

There are at least two reasons why CGT may not have a significant impact on acquisition financing:-

- 1) A number of shareholders are exempt from CGT, in particular institutional investors such as pension funds, unit trusts, investment trusts and charitable trusts.

- 2) There are a number of legitimate ways for tax

paying investors to reduce their CGT liability, (i) shareholders can claim indexation allowance on their gains, (ii) there is an annual exemption limit of £6,000² before private investors become liable to CGT (iii) capital losses on one investment can be set off against capital gains on another investment (iv) shares can be held in a tax exempt form e.g, Personal Equity Plans (PEP).

1.2.2. Information asymmetry and acquisition financing

Where the managers of either the target or the bidder possess information about the value of the transaction that is not available to the other party, then the method of payment offers opportunities for the informed party to exploit its information advantage.

The bidder's managers may have information about the true value of their firm which is not reflected in the current share price (e.g, the opportunities for future profitable investment). If the bidder's managers believe that their shares are overvalued then they have an incentive to offer equity as the method of payment (Myers & Majluf, 1984). Alternatively, if the bidder's managers have private information about the potential gains realisable from the acquisition, then they will offer cash as the method of payment. The advantage of a cash offer is that it prevents target shareholders from participating in any post merger gains (Fishman, 1989).

Target managers may have information which is not

²This is the exemption limit for 1995/96 financial year.

available to the bidder (e.g, the physical condition of assets, future contractual obligations etc). Target managers then have an incentive to deceive by accepting a cash offer which is greater than the value of the target's assets. An equity offer makes the returns to the target shareholders conditional on the future profitability of the combined firm, and hence protects the bidder from the "adverse selection" problem³ (Hansen, 1987; Fishman, 1989).

Hansen (1987) and Smith & Jennings (1993) using US data tested and rejected the hypothesis that information asymmetry affected the choice of payment currency. This issue has so far not been examined in the UK.

1.2.3. Other factors affecting the method of payment

Inexplicably, the literature on acquisition financing has concentrated on taxes and information asymmetry, to the exclusion of other factors which are equally likely to influence the choice of payment currency. In particular, the relationship between the method of payment and the choice of accounting policy has not received any attention in the literature. This thesis argues that the payment method and the choice of accounting policy are interrelated and jointly determined.

The two main methods of accounting for a business combination are acquisition and merger accounting. Although the choice of accounting method has no impact on the cash

³Adverse selection refers to the risk that a bidder discovers ex post that it has overvalued the target.

flows arising from an acquisition, there are still economic reasons why managers may have a preference for either merger or acquisition accounting. Profit related pay clauses in managerial compensation contracts and debt covenants in loan agreements are usually calculated by reference to accounting numbers which can be directly affected by the choice of accounting policy.

Accounting and statutory regulations in the UK allow some latitude in how business combinations are accounted for in the financial statements. As a result of this flexibility, the method of payment chosen can subsequently affect how the acquisition is presented in the financial statements. The inter-relationship between the method of payment and the accounting for the acquisition in the financial statements must be considered at the planning stage in order to take advantage of any benefits which the latitude in accounting rules presently permit.

The joint and simultaneous determination of the payment method and the accounting policy arises because at least 90% of the total consideration offered by the bidder must be in the form of equity in order to qualify for merger accounting. The 90% rule would imply that the choice of accounting method is partly determined by the method of payment. Similarly the method of payment is partly determined by the choice of accounting method. Consequently, in contrast to previous studies, this study investigates the relationship between the method of payment and the accounting policy choice decision of the bidder

within the framework of a simultaneous equations model which recognises their mutual dependence.

In modelling the simultaneous relationship between the method of payment and the choice of accounting policy this study examines the determinants of the accounting policy in corporate acquisitions. Most of the previous empirical evidence on the choice of accounting policy in corporate acquisitions is US based (Gagnon, 1967; Copeland & Wojdak, 1969; Anderson & Louderback, 1975). However, the US evidence cannot be directly applied to the UK since the UK has distinctive accounting rules on business combinations (eg, writing off goodwill against reserves and the availability of merger relief) which differentiates the UK from the US. The evidence presented in this study on the choice of accounting policy in the UK provides an opportunity to examine the robustness of the US evidence (see Chapter 3) to changes in the institutional environment.

In addition to the choice of accounting policy, information asymmetry and capital gains tax, there are a number of other factors which are likely to influence the type of consideration offered. These include: the capital structure of the bidder and the target, the effects of the payment currency on the dilution of existing blockholdings, the cash resources of the bidder and the target, the ability of the bidder to raise new funds in the capital market, the response of the target's management (hostile or friendly), relative size of the bidder to the target etc.

There is limited evidence on the impact of these variables on the choice of payment method in takeovers (see Table 2.1 below).

1.2.4. Empirical evidence on acquisition financing

A number of studies have examined the determinants of the method of payment in corporate acquisitions. Hansen (1987) examined the influence of debt and size on the method of payment. Amihud, Lev & Travlos (1990) concentrated on the role of insider ownership and size. Mayer & Walker (1992) examine the role of insider ownership, size and debt on the method of payment. However these studies have adopted a fragmented and piecemeal approach to this research. Individual studies have concentrated on the influence of one or two specific factors without controlling for the effects of other possibly relevant variables.

Higson (1990a) and Smith & Jennings (1993) are two studies which use a relatively broad range of explanatory variables to examine the determinants of the method of payment. However these two studies omit any discussion of the influence of accounting policy choice on the method of payment.

Apart from suffering a possible omitted variables problem, all previous studies adopt a single equation Logit methodology in the estimation of their models. There are a number of deficiencies in this approach:

- (a) a single equation estimation procedure does not

allow for an examination of the joint relationship between the method of payment and the choice of accounting policy;

(b) the Logit discriminant methodology requires a binary dependent variable, whereas the payment method is a continuous variable representing a mix of equity, cash and debt. Previous studies use selective sampling procedures as a method of obtaining a binary dependent variable. This means that only those observations where the method of payment is "pure cash" or "pure equity" are included in the sample.

In this study we address some of these inadequacies of the earlier literature:-

1) we explicitly model the relationship between the choice of accounting policy and the method of payment as jointly and simultaneously determined variables;

2) we use a comprehensive set of explanatory variables in investigating the choice of payment method in corporate acquisitions;

3) we use a statistical methodology (i.e, the Two Limit Tobit Model) which obviates selective sampling and permits observations with a mixture of cash and equity to be included in the estimation of the model.

1.2.5. Target shareholders and acquisition financing

The role of target shareholders in determining the method of payment has been largely ignored in the empirical

literature⁴. This omission probably results from the fact that researchers only have access to data on the final method of payment offered by the bidder. Any concessions which the target's managers/shareholders may have made to the bidder in pre-bid negotiations on the method of payment are not easily observed.

Studying how target shareholders make decisions on whether to accept cash or equity can enhance our understanding of the information asymmetry problem that exists between targets and bidders. One problem facing target shareholders in an equity offer is how to value the bidder's share offer. This problem arises since it is possible that the bidder may be offering overvalued equity (see Section 1.2.2). In "all equity" or "all cash" bids we observe only one method of payment hence we cannot gain any insight into how the target shareholders resolve this valuation problem and decide that cash or equity is the acceptable method of payment.

The institutional environment in the United Kingdom offers an opportunity to study the choice of payment method by target shareholders. In the UK, we observe a large number of bids where the bidder makes a "cash or equity" offer. In these bids the target shareholders are allowed the opportunity of deciding which method of payment to accept. By studying the method of payment accepted in "cash or equity" offers, we can gain some insights into how

⁴The CGT liability of target shareholders and its impact on the method of payment has received some attention in the extant literature (see Niden, 1988).

target shareholders resolve the problem of valuing the bidder's equity. In this regard, this study is the first to consider the choice of payment method from the target shareholders' perspective and provide empirical evidence on the determinants of that choice.

1.3. Impact of the method of payment on shareholder wealth

The empirical literature on corporate acquisitions has established that bidders and targets earn higher returns in cash offers than in equity offers (see Table 7.1 and 7.2 below). The most common explanations for the difference in the abnormal returns associated with cash and equity offers include information asymmetry between the bidder's managers and shareholders in both participating firms, compensation for capital gains tax, and transfer of wealth from shareholders to bondholders.

1.3.1. Capital Gains Tax (CGT) and shareholder wealth

If there is a CGT compensation effect in takeovers (see 1.2.1. above), then we would expect that in a cash offer the premium paid to target shareholders would be positively related to the level of CGT payable. If the CGT compensation premium to target shareholders is paid out of the bidder's share of expected merger gains then we would expect that in a cash offer the bidder's returns are negatively correlated with the CGT payable. While the empirical evidence that the returns to target shareholders are higher in cash offers is consistent with the CGT

compensation hypothesis, the evidence that the bidder also gains in a cash offer is inconsistent with this hypothesis. The empirical evidence does not support the CGT compensation hypothesis⁵ (Niden, 1988; Franks et al, 1988; Hayn, 1989).

1.3.2. Information asymmetry and shareholder wealth

Information asymmetry theory suggests that the method of payment conveys information to the stock market (Myers & Majluf, 1984; Fishman, 1988; Eckbo, Giammarino & Heinkel, 1990; Brown & Ryngaret, 1991). Information asymmetry models are based on the assumption that the true value of a company's assets is not known to the market. Managers who have better information about that value because they are insiders, may attempt to exploit this information advantage by issuing new equity when they believe that their shares are overvalued (Myers & Majluf, 1984). However such a strategy would reveal any overvaluation to the market and lead to a downward revision in the company's share price. The negative returns observed around the time of seasoned equity offers has been interpreted as evidence in support of the information asymmetry argument (Asquith & Mullins, 1986; Masulis & Korwar, 1986; Mikkelsen & Partch, 1986; Dierkens, 1991).

If the market believes that equity is used as a method of payment when the bidder's managers deem their shares to

⁵See 1.2.1. above for a discussion of reasons why CGT may not affect the returns to shareholders.

be overvalued, then this should cause the returns to bidders offering paper to be negative. Since the market can adjust for the information advantage of the bidder's managers, there should not be any effect on the returns to the target (i.e, target shareholders can demand additional shares from the bidder to compensate for any downward revaluation in the bidder's share price). We are not aware of any studies which have tested the information asymmetry hypothesis.

1.3.3. Wealth redistribution and shareholder wealth

Wealth transfer theory suggests that equity offers result in the transfer of wealth from shareholders to bondholders. This wealth redistribution from shareholders to bondholders is the result of a fall in the variance of the cash flows of the combined firm. Since the variance of the combined firm's cash flows is a weighted average of the variance and co-variance of the individual firms' cash flows, then where the correlation between the cash flows of the merging firms is low or negative, the variance of the combined firm's cash flow will fall.

The fall in the variance of the combined firm's cash flow reduces the default risk on the firms' outstanding debt. In the absence of any increase in the firm's cash flow resulting from synergy gains a reduction in the default risk of debt increases the market value of the debt at the expense of the shareholders (Higgins & Schall, 1975; Galai & Masulis, 1976).

In order for the wealth transfer effect to be present, the cash flows of the two firms must be combined and this implies that significant resources must not leave the group. The wealth transfer effect is stronger in business combination effected via an exchange of equity (Eger, 1983; Travlos, 1987). In a cash offer it is possible that the amount of assets (particularly liquid resources) leaving the group are so large that the cash flow profile of the combined firm is not a simple combination of the cash flows of the two independent firms. Additionally, with resources leaving the group in a cash offer, the increase in asset backing for debt is reduced, hence eroding the scope for a wealth redistribution from shareholders. The empirical evidence based largely on US studies has not supported the wealth redistribution hypothesis (Asquith & Kim, 1982; Dennis & McConnell, 1986; Travlos, 1987). We are not aware of any UK studies testing the wealth redistribution hypothesis.

1.3.4. Empirical evidence on the method of payment and shareholder wealth

The majority of studies that have examined the impact of the method of payment on announcement period abnormal returns have concentrated their analysis on addressing the question of whether the medium of exchange has an impact on the wealth experience of the parties to an acquisition. There is a limited literature which tests the theoretical explanations which have been advanced for the difference in

returns between cash offers and equity offers. The CGT hypothesis has been examined and rejected by studies in the UK and the US (Franks et al, 1988; Niden, 1988; Hayn, 1989). The wealth redistribution hypothesis has not been tested in the UK, although it has been rejected by some US studies (Asquith & Kim, 1988; Dennis & McConnell, 1986; Travlos, 1987). The information asymmetry theory has not been tested in the literature. While we know that the method of payment affects shareholder wealth, we cannot yet explain why the payment currency influences shareholder returns.

1.4. Objectives of the thesis

Having laid out the broad issues to be examined by this thesis, we now set out our specific objectives. This thesis focuses on the method of payment in corporate acquisitions and addresses three research questions:

- 1) What are the factors that influence the bidder's choice of payment currency in corporate acquisitions?
- 2) What are the factors that influence the choice by target shareholders of accepting cash or equity, when the bidder offers such a choice?
- 3) Why do cash offers result in higher returns to shareholders than equity offers?

As a subsidiary issue arising from examining the simultaneous relationship between the method of payment and the choice of accounting policy, we study the determinants of the accounting policy choice in corporate acquisitions.

1.5. Outline of the thesis

In Chapter 2 we argue that the method of payment and the choice of accounting policy are interrelated, and should be viewed as jointly and simultaneously determined decisions. The chapter reviews the existing literature on the determinants of the method of payment in takeovers. Our review identifies a number of variables that should influence the method of payment, but whose role has been largely ignored in the empirical literature on acquisition financing (eg choice of accounting policy, external blockholding, growth opportunities in the merging firms, free cash flow).

Chapter 3 reviews the literature on the determinants of the accounting policy in corporate acquisitions. The evidence from the US has concentrated exclusively on the impact of goodwill on the choice of accounting policy and ignored a number of other variables (e.g, size of the firm, gearing ratio) which have been found to significantly affect the choice of accounting policy in non-takeover contexts. The literature review reveals a lack of UK evidence on the determinants of accounting policy.

Chapter 4 outlines the simultaneous equations model which investigates the interaction between payment method

and accounting policy choices in corporate acquisitions. Additionally the definition of variables and descriptive statistics on the data for the study are provided in the chapter.

Chapter 5 presents the results from estimating the simultaneous equations model. The results are analysed with a view to understanding how the method of payment and the choice of accounting policy are related. Variables which influence the method of payment and the choice of accounting policy are identified and their economic meaning is discussed.

Chapter 6 reports and discusses the results of empirical tests on the factors affecting the choice of accepting cash or equity by target shareholders, when the bidder has offered "equity with a cash alternative" as the method of payment.

Chapter 7 reviews the existing literature on the effects of the payment method on shareholder wealth. The literature survey shows that higher returns to cash offers than equity offers is a robust result, across different time periods and institutional environments. The chapter discusses the theoretical arguments advanced to explain this result. Our survey reveals a lack of empirical tests of these theoretical explanations. Chapter 8 reports an empirical analysis of these theoretical explanations.

Chapter 9 summarises the results of our research, discusses implications for policy makers and suggests directions for future research.

CHAPTER 2.

DETERMINANTS OF THE METHOD OF PAYMENT IN MERGERS AND ACQUISITIONS :- THEORY & EMPIRICAL EVIDENCE.

2.1. Introduction

In paying for an acquisition, the bidder can choose shares, cash, loan notes or some combination of all three. The importance of each method of payment is likely to fluctuate with market conditions and, in some instances, with the prevailing fashion. The bidder's share price, gearing structure and cash resources, will all influence the method of payment. The tax position of the target shareholders will also have an impact on the method of payment. Target shareholders are more likely to accept an offer, if the consideration received is tax efficient from their viewpoint.

The impact of the method of payment on the percentage holding of existing bidder shareholders may also have an important impact on the final choice. Private information held by managers may affect the method of payment. Information asymmetry based models predict that the bidder's managers will only offer equity when they believe that its shares are overvalued and offer cash when the shares are undervalued. One of the main tasks confronting the merchant bankers advising the parties involved in an acquisition is to devise an appropriate consideration package which satisfies the financial and tax based preferences of both the bidder and the target shareholders.

The relationship between the method of payment and the choice of accounting policy may also have a bearing on how an acquisition is structured. There are two methods of accounting for a business combination which are permitted in the UK: acquisition and merger accounting. The rules governing the availability of merger accounting establish a major link between the accounting method and the payment currency. This inter-relationship must be considered at the acquisition planning stage if bidders wish to report the combination in a favourable light.

Accounting rules require, inter alia, that the bidder must offer at least 90% of the fair value of the total consideration in the form of equity in order to qualify to use merger accounting. The 90% rule implies that the choice of accounting method is partly determined by the payment method. Reciprocally, the payment method is partly determined by the choice of accounting method.

This chapter discusses the relative advantages of each of the main methods of payment and reviews the theoretical arguments and empirical evidence on the factors which are likely to influence the bidder in choosing the payment currency.

2.2. Payment methods available in corporate acquisitions

2.2.1. Shares

A bidder wishing to use equity as a method of payment faces a number of institutional and statutory requirements which have to be fulfilled in respect of the new shares

being issued. The primary institutional rule is the requirement to publish "listing particulars".

If the new shares issued will increase the number of a class already listed by more than 10%, then listing particulars must be published. The precise contents of the listing particulars are set out in Section 3 of the Stock Exchange's "Admission of Securities to Listing" (the Yellow Book, 1984 edition)¹. If any new class of securities is to be listed as a result of the bid, then a formal notice must appear in a national daily newspaper, which must specify the address where the full listing particulars are available for inspection. The bidder must make arrangements for details of listing particulars to be circulated in the Extel Statistical Service. In an equity offer, the requirement to publish listing particulars can place a significant cost burden on the bidder.

A bidder wishing to use equity, must also consider the statutory protection given to its existing shareholders by Section 80 of the 1985 Companies Act. Sec.80 CA 1985 provides that no shares (or securities carrying conversion rights into shares) may be issued by the directors without the authority of that company given either in a general meeting or by the Articles of Association. Such authority must state the maximum amount of shares that may be issued and the time period not to exceed five years, in which this may be done. If shareholder approval is required under Section 80, an extraordinary general meeting of the company

¹Since 1/12/93 called the "Stock Exchange Listing Rules".

must be convened, for which 21 days notice is required.

There are circumstances in which the bidder wishes to issue equity, but the target shareholders would prefer to receive cash. In such situations, this difference may be reconciled through a vendor placing or vendor rights. Under these schemes the bidder issues shares to the target's shareholders, but arranges for its merchant bankers to buy back these shares at a fixed price.

Any shares bought by the merchant bankers can either be offered to the bidder's existing shareholders (vendor rights) or placed in the market (vendor placing). One of the problems with an equity offer is that the target's shareholders are compelled to place their own value on the bidder's shares. A cash underwritten alternative reduces this problem by providing a secure value for the bidder's shares. However this backing is provided at some cost in terms of the fees payable to underwriters.

As the shares issued under a vendor placing or vendor rights are not issued for cash, the statutory pre-emption rights provided by Section 89 of the 1985 Companies Act² do not apply. Consequently existing shareholders may suffer a dilution in their percentage shareholding when these new share are placed in the market.

In its memorandum on "shareholders' pre-emption rights

²Section 89 Companies Act 1985 imposes statutory pre-emption rights in favour of existing shareholders whenever there is a new issue of shares. These rights provide that any new issue of shares must be made proportionately to existing shareholders in terms of the nominal value of existing shares. This rule makes a rights issue compulsory. However the pre-emption rights do not apply where the issue of shares is wholly or partly for a consideration other than cash.

and vendor placings" issued in February 1989, the Investor Protection Committee (IPC) of the Association of British Insurers (ABI) stated that where the shares issued by the bidder exceeds 10% of its existing issued share capital, then a claw back offer must be made available to the existing shareholders³. Although the guidelines from the IPC do not have the force of law, they are usually persuasive given the power of institutional shareholders. Under a claw back offer, the bidder's existing shareholders are given the right of first refusal over the new shares. The claw back offer must be available for at least 21 days.

2.2.2. Cash

Cash offers are quick, clean and avoid most of the legal and institutional complexities associated with equity offers. Unless internal cash resources are adequate to finance the bid, the bidder would have to resort to medium or long term borrowing. The ability of the bidder to borrow to finance a cash offer will depend on its existing level of borrowing, the type of security it can offer, the amount of additional cash flows which will be generated from the acquisition etc.

Borrowing funds in order to finance a cash offer might result in some restrictions being placed on the bidder by the lenders, since lending agreements tend to incorporate restrictive covenants (Smith & Warner, 1979; Citron,

³The claw back is popularly referred to as a "vendor rights" offer.

1992a). The terms on which the bidder is able to borrow, in order to finance a cash offer will be important in choosing the method of payment.

Alternatively the bidder could finance the cash offer via a rights issue. In this case, new shares are offered to its existing shareholders on a pro-rata basis at a discount to the existing market price. A rights issue requires the preparation of listing particulars (Section 3, Chapter 1, Yellow Book, 1984 edition). Additionally the issue is normally underwritten in order to guarantee that the necessary funds will be raised. Underwriting commissions can be quite substantial. As a rights issue must be open for at least 21 days this can represent a substantial time delay in raising the funds required to finance the cash offer.

In certain situations, the bidder may not have a choice of which method of payment to offer. A cash offer may be mandatory under the City Code on Takeovers and Mergers (the City Code). Rule 9 of the City Code provides that if a person acquires 30% or more of the voting rights of the target, or when they already have more than 30% acquire 1%⁴ of the voting rights within a 12 month period, then a general offer in cash or with a cash alternative must be made for the balance of the company's shares at the highest price paid in the previous 12 months. Rule 11 of the City Code provides that, where a person has purchased

⁴Prior to 3/3/1993, the relevant percentage was 2%

in the last 12 months, preceding a general offer 10%⁵ or more of the voting rights, then a subsequent general offer must be for cash or must include a cash alternative at the highest price paid during the period.

2.2.3. Loans

From the bidder's point of view, loans have a number of advantages as a method of payment. Interest payments on loans are tax deductible, while dividends are not. Loan financing could lead to an increase in earnings per share (so long as profits from the acquisition cover the interest payments). Target shareholders accepting loan notes as consideration can claim roll over relief against any capital gains tax liability⁶. Loan capital can be issued in a variety of ways, listed loan stock, convertible loan stock and warrants.

Any company issuing listed loan stock has to draw up listing particulars for the loans issued. The exemption available for small equity offers (i.e, any issue less than 10% of a class already in issue) does not apply. The contents of the listing particulars are detailed in chapters 1 and 2 of section 3 of the "Yellow Book (1984

⁵Prior to 26/6/1989, the threshold was 15%.

⁶If the loan stock is classified as a 'qualifying corporate bond' (ie, loan stock issued after 13 March 1984 by a company whose shares are quoted on a recognised stock exchange) then target shareholders are entitled to a 'hold over' rather than 'roll over' relief. The distinction between the two is that under 'hold over' relief capital gains accrued by target shareholders are frozen, carried forward and become liable for CGT when the loan stock is eventually disposed off. This treatment arises because qualifying corporate bonds are exempt from CGT.

edition)". The loan stock will usually be secured by a trust deed entered into between the bidder and a trustee appointed to represent the interest of the bondholders. The minimum contents which must be included in the trust deed are detailed in chapter 2 of section 9 of the "Yellow Book".

Convertible loan stocks are loan stocks with equity conversion rights. The conversion rights usually enable the stockholders to convert from debt into equity at a future date and fixed price. The stockholders get a guaranteed income in the form of interest, security for their holding (if the loans are secured) and the opportunity to convert into equity, if the bidder prospers. Additionally any increase in the price of the bidder's equity will be reflected in the price of the convertible loan stock. The advantages to the bidder of a convertible issue include:-

- (1) a lower interest rate is paid in exchange for the conversion rights in comparison to a straight loan issue;
- (2) it is a form of borrowing which if everything goes well never has to be repaid.

However the bidder would need to consider some potential disadvantages of a convertible issue. The fixed conversion price will usually represent a discount on the existing market price (otherwise target shareholders have no incentive to accept the convertible). This discount can only be at the expense of the existing shareholders. Also when the conversion takes place, the percentage shareholding of existing shareholders will be diluted. A

convertible involves greater administrative costs than a straight loan stock. Conversion notices have to be sent to stockholders prior to every conversion period and the share register has to be updated regularly with small parcels of shares.

Warrants entitle the holders to subscribe for the bidder's shares at some future date at a fixed price. The main difference between a warrant and a convertible is that warrants are separated from the underlying security with which they were issued and are traded separately on the stock exchange. At some stage in the future, warrants will result in the inflow of cash to the bidder, although the amount and timing of these inflows is uncertain. They are usually issued in order to make the terms of a bid more attractive to the target shareholders, but without an immediate cost to the bidder. The negative effects which a convertible has on existing shareholders also apply to warrants.

2.3. Accounting policy choice and the method of payment

Accounting policy preferences of firms are influenced by a variety of considerations. Watts and Zimmerman (1978) argue that management's support or opposition to a proposed accounting standard depends upon the size of the firm and whether the proposed standard increases or decreases the firm's reported earnings.

Large firms are more likely to support income reducing standards due to tax, political and regulatory benefits. On

the surface a decision, to support an accounting standard which reduces profits may appear to be counterproductive. However, large firms have high public visibility and a high profit figure can result in (i) accusations of profiteering⁷ (ii) political pressure for increased taxes on these profits (iii) increased scrutiny by the anti-monopoly agencies.

Large firms can seek to reduce their vulnerability to these pressures by supporting and adopting accounting policies which reduce their profits (Watts & Zimmerman, 1978; Hagerman & Zmijewski, 1979; Zmijewski & Hagerman, 1981). These benefits are traded off against the costs of reporting lower earnings such as loss of earnings related compensation, lower interest and dividend cover, downgrading of the company's future prospects by the stock market.

While the above considerations are important, the choice of accounting method (i.e, acquisition or merger accounting) is in practice restricted by the relevant accounting standard (SSAP 23)⁸. In order to qualify to use merger accounting, bidders are required to offer equity for not less than 90% of the fair value of the total consideration paid. Thus method of payment in acquisitions

⁷There is a general tendency for the public to associate high profits by large firms with monopoly rent (Watts & Zimmerman, 1978).

⁸SSAP 23 which was the relevant accounting standard operating throughout the period covered by the sample in this study (1/1/80 to 31/12/90) was withdrawn in September 1994 and replaced by Financial Reporting Standard (FRS) 6. However FRS 6 requires that the majority of the consideration paid to target shareholders must be equity in order to qualify for merger accounting (see Section 3.2.2 below).

is one of the determinants of the accounting method choice.

Choice of payment method in acquisitions is, however, not determined entirely by accounting considerations. A number of studies in the finance literature have suggested, and empirically identified, factors which bear upon the payment method choice by bidders. These factors encompass bidder's capital availability, financial and ownership structure as well as information asymmetry between bidder and target shareholders.

There have been few studies concerned with the impact of the bidder's choice between merger and acquisition accounting on payment method. Yet such a choice must be reflected in the payment method decision because of the 90% rule referred to above. As Wyatt (1967) notes:

"...the accounting for a combination is commonly decided in advance of consummation of the transaction. That is, the accounting treatment is one of the variables that must be firmed up before the final price is determined."

2.4. Information asymmetry and the method of payment

Information asymmetry theory is based on the assumption that in any transaction, if one participant has superior private information then an attempt will be made to exploit this information advantage to the possible detriment of the other participants to the transaction. In takeovers either the bidder or the target can have superior information about the value of its assets.

Information asymmetry affects cash offers and equity offers differently due to the contingent pricing effects of

equity. With a cash offer the value of the consideration paid to acquire the target is determined ex-ante (i.e, at the date of the offer) since there is no private information about the value of cash. The true value of an equity offer is determined ex-post (i.e, after the date of the offer) since it depends on the post merger profitability of the enlarged group.

When the target has private information about the value of its assets it will only agree to a trade with the bidder, if the value of its assets is less than the value of the consideration offered by the bidder. The bidder therefore faces a valuation risk or adverse selection problem⁹. To mitigate the negative impact of this valuation risk the bidder can make an equity offer, whose value is determined by the future profitability of the group. The advantage here is that the target shareholders bear part the valuation risk.

When the bidder has private information on the value of its equity then the target shareholders face a similar adverse selection problem that the equity offer may be over valued. Indeed, the target shareholders' likely presumption is that the bidder will attempt to exploit any over valuation and convert its over valued equity into real assets. Similarly target shareholders may presume that cash offers are only made when the bidder believes that its equity is undervalued. The conclusions of some of the main

⁹Valuation risk refers to the possibility of the bidder discovering ex-post that its valuation of the target's assets was incorrect.

models in the literature which investigate the conditions for equilibrium in the presence of information asymmetry are discussed below.

2.4.1. Relative size of the bidder to the target and the method of payment

Hansen (1987) examined the bargaining process in a merger or acquisition. He developed a model in which the determination of the choice of exchange medium is the result of a two agent bargaining game under imperfect information. Hansen concludes that when the target is assumed to know the true value of both its own assets and the bidder's assets, but the bidder is only aware of the true value of its own assets (i.e, the target is assumed to have an information advantage) then:-

a) Equity offers can establish a trade¹⁰ between the bidder and the target in circumstances where cash offers cannot effect a trade. (i.e., equity dominates cash as a medium of exchange);

b) The probability of an equity offer decreases as the size of the bidder increases relative to the size of the target;

c) The probability of an equity offer increases with the level of financial gearing of the bidder and decreases with the level of financial gearing of the target.

Hansen uses a significant amount of algebra to

¹⁰Trade refers to the acceptance of the bidder's offer by the target.

establish his results, but the intuitive reasoning behind his conclusions is as follows:-

Conclusion (a) reflects the fact that an equity offer establishes the actual acquisition price ex-post. Consequently the bidder is able to use an equity offer to reduce the adverse selection problem associated with its uncertainty of the true value of the target's assets. If the bidder makes a cash offer with a value of C , and the true value of the target's assets is V , the bidder faces the risk of discovering after consummation of the deal that $V < C$ (i.e, with a cash offer the bidder runs the risk of buying a "lemon").

With an equity offer some of the adverse selection risk is passed on to the target. If the bidder makes an equity offer with a value E and after the acquisition it is discovered that $V < E$, the post transaction value of the enlarged group will fall and so will the value of the acquisition price paid to target shareholders. From the target's point of view the dominance of an equity offer still holds, because the target has no difficulty in determining the value of an equity offer since it has an information advantage. Therefore if a cash offer with a pre transaction value of C is acceptable to the target, then an equity offer E which is at least equal to C will also be acceptable to the target (i.e, C puts a floor under the consideration).

It must be pointed out that the dominance of an equity offer established in Hansen's model is based on the

assumption that the bidder is always able to create value out of the acquisition. Formally Hansen assumes that if $W(V)$ is the value of the target's assets to the bidder then $W(V)$ is an increasing function of V and $W(V) > V$ for all values of V . While it may be possible to argue that from the bidder's point of view $W(V) > V$ is a necessary condition for making an acquisition there is no reason for target shareholders always to believe that the bidder will create value out of the acquisition.

If the possibility that target shareholders can face a post-acquisition moral hazard problem (i.e, that the bidder fails to create value out of the acquisition) is introduced into Hansen's model, it is doubtful if, ceteris paribus, the dominance of equity offers will still hold.

Conclusion (b) is based on the idea that the contingent pricing advantage of equity offers depends on the target's assets being a significant addition to the bidder. As the bidder increases in size relative to the target the valuation risk and contingent pricing advantage of equity offers diminish. When the bidder is too large relative to the target, the beneficial price contingent effect of an equity offer is negligible.

Conclusion (c) reflects the fact that the contingent pricing advantage of an equity offer is stronger the larger the equity of the target is relative to the equity of the bidder. If we imagine two bidders 1 and 2, with the same level of total assets but with different levels of debt $D1$ and $D2$, where $D1 > D2$, then the equity component $E1 < E2$.

If both bidders were to acquire a target with a given size V , bidder 1 will gain more from an equity offer than bidder 2, because the smaller size of its equity increases the contingent pricing advantage of the equity offer. Therefore as the bidder's gearing increases, the contingent pricing advantage of an equity offer increases. A similar argument can be developed to show that the contingent pricing advantage of an equity offer to the bidder falls as the target's gearing increases.

2.4.2. Overvaluation of the bidder and the method of payment

Myers & Majluf (MyM) examine the behaviour of managers and investors, in a model which assumes that managers have superior information about the value of a firm's existing assets and future investment opportunities. The MyM model is built on two central assumptions:

- 1) Managers act in the interests of existing shareholders.
- 2) Existing shareholders are passive and do not adjust their portfolios in response to the firm's investment decisions.

With these assumptions the MyM model leads to the following conclusions:

- 1) Where a company has no financial slack¹¹ the firm may reject positive NPV projects rather than issue equity

¹¹Financial slack is defined as cash and marketable securities held by the firm plus total risk free debt that can be issued by the firm.

to finance the project, if managers believe that the firm's equity is undervalued.

2) The issue of stock will always result in a fall in the value of existing shareholders' wealth.

MyM establish that the issue of equity would only result in the maximization of existing shareholder wealth, if the proportion of existing firm value accruing to the new shareholders is less than the increase in the value of the firm resulting from using the proceeds of the equity issue. If this condition is violated the firm should reject the project irrespective of whether it might be a positive NPV project. This reflects the fact that the under pricing of the new issue may be so severe that the new shareholders earn more than the NPV of the new project with a consequent loss to existing shareholders. Presumably a rights issue can avoid this problem, since existing shareholders are given the first opportunity to acquire the whole of the NPV from the new project. However an equity offer in a takeover, creates a distinct body of new shareholders who can acquire all the gains generated by the acquisition and part of the wealth of existing shareholders, if the underpricing in the bidder's equity is severe.

Conclusion 2 seems to contradict existing finance literature. If a project has a positive NPV, why should the issue of equity to finance the project lead to a fall in the share price?. This pessimistic result arises directly out of the existence of information asymmetry between the managers and investors. In the MyM model a value maximising

manager will issue new equity and invest in a zero or negative NPV project so long as the value of the new assets accruing to the new shareholders is less than or equal to the value of the equity issued (i.e, equity may be issued at a premium). Therefore the issue of new equity does not automatically signal the existence of a positive NPV project. Since investors are aware of the possibility that a new equity issue could simply result in the transfer of wealth from themselves to existing shareholders, the market is likely to interpret any new issue of equity as bad news.

2.5. Taxation and the method of payment

Although the taxation of mergers and acquisitions in the UK is a complicated subject, the actual scope for increasing value through tax planning in an acquisition is extremely limited. While bad tax planning can be costly, good tax planning is not likely to result in the exploitation of tax opportunities to create value in an acquisition (except in specific and unusual cases, e.g, to utilise irrecoverable advance corporation tax).

In this regard the UK corporate tax environment is in sharp contrast to the USA where prior to the Tax Reform Act (1986), it was generally believed that tax planning could independently add value to an acquisition. Niden (1988: Chapter 2) provides a comprehensive discussion of the tax planning opportunities available in the USA prior to

1986¹².

While value creation by the bidder as a result of tax benefits is limited in the UK, there can be a direct taxation impact on the wealth of the target shareholders as a result of the type of consideration received from the bidder. Under UK tax laws a disposal of shares by a chargeable person is a taxable event unless the consideration received by the vendor is in the form of shares or debentures in another company. (Section 85 Capital Gains Taxes Act 1979).

In an equity offer the target shareholders can claim roll over relief and avoid the crystallisation of any capital tax liability, until the vendor sells the new shares received in the equity offer. If prior to the bid the bidder held more than 5% of any class of the share or loan capital in the target, then in order for roll over relief to apply, it will be necessary to demonstrate that the transaction was effected for bona fide commercial reasons and not designed primarily for tax avoidance purposes. Where doubt exists, then a procedure for obtaining prior clearance from the Inland Revenue is available under Section 88 CGTA 1979.

In an efficient market, the differences in the taxation treatment of equity and cash offers will tend to compel bidders to either finance with an equity offer or

¹²The main sources of tax benefits in US takeovers were: (i) the step up in value of the target's assets in calculating tax allowances (see Section 7.4. below for a further discussion), (ii) the utilisation of the target's losses and tax credits by the bidder.

else offer a higher premium in a cash offer to compensate target shareholders for the capital gains tax arising on the disposal of their shares. Carleton et al (1983), Wansley et al (1983), Huang & Walkling (1987), Franks et al (1988) provide evidence that the bid premium is significantly higher in cash offers than in equity offers. These results would be consistent with the tax compensation hypothesis. However, it should be noted that alternative arguments based on information asymmetry (Myers & Majluf, 1984) would also be consistent with these results.

Franks et al (1988) cast serious doubt on the ability of the tax compensation hypothesis to explain the higher bid premium observed in cash offers. They observe that:-

- 1) Higher bid premium in cash offers were observed prior to 1965 when capital gains tax was introduced in the UK.

- 2) Target bid premia in "cash or equity" offers were comparable with the bid premia in "all cash" offers. Since "cash or equity" offers should reduce any adverse personal tax consequences of the offer, it was expected that "cash or equity offers" would be associated with a lower bid premia than all cash offers.

Niden (1988: Chapter 4) is the only study that has examined the role of taxation in acquisition financing. She used the following variables as proxies for the impact of the acquisition on the CGT position of the target shareholders on the method of payment:- proportion of target shares held by institutional investors, target's

dividend yield¹³, variability of the target's market adjusted return in the pre bid period¹⁴, increase in the target's share price over the six months period preceding the bid. She performed Logit regressions to examine whether the type of consideration offered was a function of the tax status of the target's shareholders. Her Logit regressions had very low explanatory power and most of the coefficients of her tax variables were not significant nor did they have the predicted sign. Niden concluded that there was no relationship between the tax status of the target's shareholders and the form of consideration offered in the acquisition.

The result that CGT cannot explain either the higher bid premium in cash offers or the choice of payment method may be rationalised by the availability of legitimate tax schemes which allow individual investors to reduce their CGT liability¹⁵.

2.6. Share ownership structure and the method of payment

There have been some recent attempts in the literature on the theory of capital structure to explain the existence of an optimal debt-equity ratio in terms of managerial

¹³Niden suggested that high income tax investors bought shares in low yield firms, while low tax investors bought shares in high yield firms.

¹⁴Without giving an adequate explanation, Niden suggested that the average tax rate of a firm's shareholders is an increasing function of the variability of that firm's common stock returns.

¹⁵See Section 1.2.1. for a summary of the principal methods available for reducing CGT liability.

control of voting rights. The related models marry the literature on the market for corporate control with the capital structure theories by exploiting the fact that equity shares have voting rights while debt does not. The main models in this area are Stulz (1988) and Harris & Raviv (1988). These two models develop a relationship between the voting rights controlled by management and the value of the firm.

2.6.1. Managerial control of voting rights and the value of the firm

Stulz (1988) uses managerial control of voting rights (MCVR) as a construct to examine the attractiveness of a company as a takeover target. In Stulz's model the proportion of voting rights controlled by managers affects the firm's likelihood of being a takeover target and the size of the bid premium received. An increase in MCVR will increase the value of the firm because it increases the size of the takeover premium. This result is derived from the assumption that the passive shareholders who hold the remaining shares not held by managers have heterogeneous opportunity costs for selling their shares (ie, the premium demanded by the owner of the i th share is not equal to the premium demanded by the owner of the j th share).

Target shareholders can demand different premia due to their differing capital gains tax position, loyalty to the existing management etc. Therefore the bigger the level of MCVR the greater the proportion of passive investors shares

that must be obtained by the bidder¹⁶ and hence the larger the premium the bidder must offer to target shareholders.

Above a certain level, an increase in MCVR will result in a fall in the value of the firm. This result is based on the assumption that as MCVR increases the probability of a takeover declines. If managers control more than 50% of the votes the probability of a hostile takeover bid is zero. As the probability of a takeover declines, so does the probability that the passive investors will realise the control premium associated with a takeover. Stulz shows that there is an optimal level of MCVR at which the value of the firm is maximised.

Stulz then argues that given a personal wealth constraint limit, managers can increase their control of voting rights by increasing the firm's leverage¹⁷. Increasing leverage will have two effects on the value of the firm: (i) increase the potential premium available from a future bidder by increasing MCVR (ii) reduces the probability that the bid premium will be realised, since an increase in MCVR reduces the chances of a future bidder succeeding. With these two opposing effects, Stulz derives the result that there is an optimal level of leverage that

¹⁶If managers control 10% of the votes, then the bidder would have to acquire 55.55% (i.e., $50/90$) of the votes held by passive investors in order to gain control. With managers controlling 20% of the votes, the required percentage rises to 62.5% (i.e., $50/80$).

¹⁷For example, let us assume that managers have a total wealth of £100. They wish to invest in a project costing £1000. If they issue 1000 shares with a nominal value of £1, then they will control 10% of the votes. Alternatively by issuing 500 shares and raising £500 by debt instrument, they can increase their control over the firm's votes to 20%.

maximises the value of the firm.

Since equity offers dilute MCVR while cash offers do not, Stulz's model suggests that where managers value the benefits of control the probability of an equity offer will be inversely related to both the bidder's MCVR and leverage.

2.6.2. Managerial control of voting rights and the type of takeover attempt

Harris and Raviv (1988) analyse the effects of insider control and financial leverage on the type of takeover method (i.e, tender offer or proxy contest). Their model postulates that the target's management can influence the type of takeover attempt and its probability of success by choosing the level of MCVR. Changes in MCVR are affected by the level of debt. Issuing more debt increases the level of MCVR.

Increasing leverage (by increasing MCVR) will reduce the probability of the incumbent management being voted out. This increases the probability of reaping the benefits of control, but reduce the likelihood of obtaining capital gains through a takeover. Additionally increasing leverage could reduce the benefits of control by increasing the probability of bankruptcy, and by increasing the monitoring activities of creditors which reduce the ability of management to mis-allocate free cash flow. By trading off these factors, the target's management can determine an optimal level of MCVR (and an optimal capital structure).

This would simultaneously determine the probability of various takeover methods.

If the target's management has sufficient control over votes (by choosing an appropriately high level of debt) to guarantee that a hostile bidder fails, then we will observe an unsuccessful tender offer. Conversely a very low level of debt (and MCVR) will result in a successful tender offer. Intermediate levels of debt, which imply that neither the bidder nor the incumbent management can be sure of achieving control, will result in a proxy fight.

The main insight of the model is that the target's management can influence the type of takeover method and its outcome by manipulating its control of the firm's votes through its policy on capital structure.

2.6.3. Dilution of external blockholdings

While there is some literature which discusses the attenuating effects of equity offers on managerial shareholding (Harris & Raviv, 1988; Stulz, 1988), very little attention has been paid to the dilution of shares held by large external blockholders. There are legal rights associated with different levels of shareholdings which the external blockholder may not wish to see diluted:-

- 5%: the right to object to the courts against a proposed re-registration of the company as a private one (sec.54 CA 1985);
- 10%: the right to requisition an extraordinary general meeting of the company (sec.368 CA 1985);

the right to petition the Department of Trade to appoint inspectors to investigate the company's affairs (sec.431 CA 1985);

15%: the right to object to a court against a proposed variation of class rights (sec.127 CA 1985);

the right to object to the courts against a proposed change in the company's objects clause (sec.4 CA 1985);

26%: the right to block any actions of the company which by virtue of the Companies Act 1985 can only be carried out by a special resolution of the company (e.g, voluntary liquidation, change of articles, change of name, scheme of arrangement etc).

Apart from the dilution of the legal rights discussed above, there are economic benefits associated with a large block of shares which the blockholder may not wish to see diluted. Principally a large blockholding provides a platform or toehold from which the blockholder can launch a future bid¹⁸. The benefit of the toehold is that it can help the bidder avoid the "free-rider" problem. This issue is addressed in the models of diffuse shareholding discussed by Grossman & Hart (1980) and Shleifer & Vishny (1986).

The "free-rider" problem arises when individual shareholders who hold small numbers of shares, refuse to

¹⁸Although blockholders such as institutional investors are unlikely to bid for a company themselves, they can use their block of shares to help facilitate a bid by another raider.

accept an offer from the bidder. Each shareholder reasons that his decision with regard to the bidder's offer will not affect the outcome of the bid, since his shareholding is small. They therefore hold on, in the hope of participating in any value increases resulting from the takeover. The cumulative result of these individual decisions, is that the bid will fail.

Both Grossman & Hart (1980) and Shleifer & Vishny (1986) argue that as a result of the "free-rider" problem a bid will not succeed unless the offer price exceeds the value of the company under the bidder's management. However the bidder is only willing to pay a maximum price equal to the potential value of the target less the cost of prebid monitoring and the cost of the bid. This implies that the attempt by the small investors to "free ride" and participate in any post merger gains could ensure that the offer price is insufficient to guarantee victory for the bidder. At the extreme the "free rider" problem would suggest that takeovers would not occur at all, so long as the incumbent shareholders demand the entire value of any surplus in return for their shares.

A large pre-bid toehold can mitigate the "free rider" problem. If a bidder has a sufficiently large initial shareholding, then the capital gains profit accruing on this stake when the bid is announced, could be enough to compensate the bidder for his monitoring and bid costs, hence providing an incentive for the bidder to launch a bid.

In the Shleifer & Vishny model, as the proportion of the firm held by the bidder rises so does its share of any takeover gains. Additionally as the bidder's toehold rises, a takeover becomes more likely and the target's share price increases. When a takeover does occur the premium above the prevailing stock price would be lower. The lower premium results from two factors (i) the increase in the pre takeover market price of the target (ii) the bidder is willing to launch a takeover for a smaller increase in the post takeover profits of the target.

An external blockholder will wish to avoid any dilution of their shareholding resulting from an equity offer, if the shares represent a strategic investment (ie, a toehold) which forms the platform for launching a future a takeover bid.

2.7. Market conditions and the method of payment

It may be reasonably deduced that a manager's decision to raise funds through a seasoned equity offer will be affected by the recent performance of the company's shares and the returns on the market as whole. Smith (1977), Marsh (1979), Levis (1993) found evidence of significant abnormal returns on a company's stock in the period preceding a seasoned equity issue. This suggests that firms time the issue of new equity to coincide with periods when their share prices are rising This association between share price performance and the timing of seasoned equity offers could be explained by one of the following factors :-

1) Managers as insiders believe that their shares are over valued. This is a feasible scenario, if the market is strong form inefficient, and managers attempt to take advantage of this mispricing.

2) The recent financial performance of the company and its managers has been excellent and this is presently reflected in the share price. The managers have therefore decided to raise new capital in a period when they are the 'darlings of the market'.

The recent return on the overall market could also have an impact on the timing of a seasoned equity offer. In periods of a rising market, investor confidence is high and there will be a general willingness to invest money in the market. In a falling market, investors are likely to be more risk averse and generally unwilling to undertake speculative investments. Taggart (1977) found evidence that seasoned equity issues tend to follow periods of market rises.

The empirical evidence from the seasoned issues literature would lead to an expectation that the level of the market index and the bidder's share price will be positively correlated with the proportion of equity in the method of payment.

2.8. Capital structure and the method of payment

Since the Modigliani & Miller (1958) seminal paper, the question of whether an optimal capital structure exists has dominated much of the literature in financial

economics. If capital structure does not affect the value of the firm, then a priori we cannot expect that the impact of an acquisition on the bidder's capital structure should influence the choice of payment method. However if an optimal capital structure does exist, then the impact of the acquisition on capital structure can be expected to affect the choice of exchange medium.

The balance of the empirical evidence at present would suggest that there is some pre-set capital structure which firms try to attain. Marsh (1982), Jalilvand & Harris (1984), Lasfer (1991) provide evidence that firms attempt to maintain target levels of gearing. Assuming the existence of a target capital structure, we may expect that managers will view acquisition financing as part of their normal financing decisions. Firms above their pre-set capital structure may seek to issue equity in an acquisition in order to adjust down their gearing ratios. Firms operating at the desired level of gearing will be inclined to use internal funds to finance acquisitions (i.e, cash offers). Firms below the desired level of gearing will be inclined to finance the acquisition through new debt instruments.

It is arguable, however, whether capital structure should have any influence on the method of payment, even if one believes that some optimal or target gearing ratio exists. If a bidder uses equity to finance an acquisition, thereby reducing the gearing ratio to a level below optimal, this implies that debt is more likely to be used

to finance future projects. Conversely if the bidder finances the acquisition with debt, then a rights issue could be used in future to restore the equity base. Ignoring the effect of an acquisition on capital structure will depend on how comfortable the bidder is with temporary deviations from the "normal" gearing ratio.

It is conceivable that bidders with a high level of gearing would find it comparatively more difficult to raise the funds necessary to finance a cash offer. Increases in leverage, the reduction of liquid resources and a possible loss of control to creditors associated with a cash offer could be more expensive for a bidder already carrying a high level of debt. Consequently bidders with a high level of debt may choose to finance acquisitions with equity.

The capital structure of the target may also influence the method of payment. Targets with a high level of gearing would already be subject to a high level of external monitoring by the creditors (Jensen, 1986). A bidder can free ride on the monitoring activities of the creditors. This reduces the valuation risks¹⁹ faced by the bidder with a consequent reduction in the price contingent advantage of an equity offer. This implies that targets with high gearing are more likely to be acquired via a cash offer.

2.9. Growth opportunities in the merging firms and the method of payment

Myers' (1977) under-investment model describes the

¹⁹See 2.4. above for an explanation of valuation risk.

firm as a combination of assets in place and call options on future growth opportunities. The value of these call options depends on the probability that managers will exercise them. Myers shows that situations may arise where managers of firms with outstanding risky debt may refuse to exercise the option on projects with a positive net present value because acceptance of the project by increasing the asset backing for the outstanding debt (with a consequent increase in the value of the debt) reduces the value of shareholder's wealth.

Myers (1977) also shows that the higher the level of debt in the firm's capital structure the greater the probability that managers will be forced to take sub optimal investment decisions²⁰. If a high level of debt will result in an under investment incentive problem, then a possible solution is that, firms with growth options should reduce the level of debt in their capital structure. Myers predicts that the firm's leverage is inversely related to the proportion of the firm's value which is accounted for by growth options. Smith & Watts (1993) and Gaver & Gaver (1993) show that firms with growth options have low debt/equity ratios. This suggests that takeovers in which either the bidder or the target have significant amounts of growth options are more likely to be financed

²⁰Since debt holders have a senior claim on project cash flows, the greater the amount of debt in the capital structure, the greater the probability that the firm's cash flows are paid out to creditors rather than shareholders. Positive NPV projects thus add to the security of the creditors and provide less benefits to shareholders. This increases the probability that managers acting in the interests of shareholders would under-invest (i.e, reject positive NPV projects).

with equity.

2.10. Cash resources and the method of payment

The free cash flow hypothesis (Jensen, 1986) argues that where managers have cash flow in excess of that necessary to finance positive NPV projects, instead of returning such excess cash flow to shareholders, managers would choose to make acquisitions. Returning excess cash flow to shareholders might signal that managers do not have any more positive NPV projects with the result that their shares could be downgraded by analysts. If free cash flow motivates the acquisition then it is more likely to be financed with cash. The liquidity of the bidder will also be expected to affect the method of payment. Cash rich bidders are in a better position to make a cash offer than cash poor firms.

Additionally a bidder acquiring a cash rich target is more likely to make a cash offer since the cash resources of the target can be used to help finance part of the cost of the acquisition. The utilisation of the target's cash resources in this manner, is limited by Section 151, 1985 Companies Act, which makes it unlawful for a company to give financial assistance, directly or indirectly, for the acquisition of its own shares.

2.11. Target managerial resistance and the method of payment

When a bid has not received the support of the

target's management, the target's shareholders would probably prefer to receive a consideration that is easy to value (i.e, cash). Resistance by the target's management could therefore affect the method of payment.

Persuasion is an important and critical component of defence strategies in the UK. The target management usually try to persuade their shareholders that they will be worse off under the bidder. Defence documents will almost certainly refer to the "poor" financial and share price performance of the bidder and the general "incompetence" of the bidder's management. (Sudarsanam, 1991). The effectiveness of these defence tactics will be undermined in a cash offer (Peterson & Peterson, 1991; Sudarsanam, 1994b). With cash the bidder can reduce the scope of the target's management defence strategy.

Cash may also have a pre-emptive role in a hostile takeover. The use of cash as a method of payment can signal that the bidder has a high valuation for the target and hence forestall the emergence of a competing bid (Fishman, 1989)²¹.

2.12. Previous research on the choice of payment method

There is limited published empirical research investigating the choice of payment method in corporate acquisitions.

Carleton et al (1983) was the first paper to

²¹A bidder with a high valuation for the target will offer a high premium. This discourages rival bidders because of the increased cost associated with mounting a bid.

specifically examine the factors that may influence the choice of payment in corporate acquisitions. They estimated binomial probit regressions comparing equity and cash offers using a sample of 61 firms (30 cash offers and 31 equity offers) which were acquired during the years 1976 and 1977. They found that:

(1) the higher the dividend payout ratio of the target, the higher the probability that the target would be acquired via an equity offer. However they were unable to offer any explanation for this result.

(2) the lower the market-to-book ratio of the target, the higher the probability that the target is acquired in a cash offer. Carleton et al suggested that where the market-to-book ratio was positively correlated with the amount of goodwill created in a cash offer, then this result would be consistent with an attempt by bidders to avoid the creation of goodwill and its resultant depressing effect on earnings per share, when amortised.

Hansen (1987) focused on the role of debt and size on the choice of payment method. His model predicts that the probability of an equity offer is negatively related to the relative size of the bidder to the target, the gearing of the target and positively related to the gearing of the bidder (see Section 2.4.1). He used a sample of 106 acquisitions over the period 1976-78. He estimated some Logit regressions comparing equity offers and cash offers using the bidder's and the target's gearing and the

relative size of the bidder to the target²² as the explanatory variables. In some of his models Hansen found that the probability of an equity offer increased with the size of the bidder's total liabilities (not deflated for size), although in other models this result was not sustained. Additionally none of the measures of gearing in Hansen's study was significant. Hence the best conclusion we can reach is that Hansen provides moderately supportive evidence that the level of total liabilities of the bidder might have an impact on the method of payment.

Amihud, Lev and Travlos (1990) examined the role of size and insider ownership as determinants of the method of payment. Using a sample of 209 acquisitions over the period 1981-83, they ran binomial Probit regressions comparing equity financed and cash financed acquisitions. Amihud et al found a significant negative relationship between the probability of an equity offer and the fraction of shares held by the bidder's managers. This is consistent with the hypothesis that managers use the method of financing to increase their control over the firm. However they did not find any evidence in support of Hansen's (1987) proposition that the size of the target relative to the bidder affected the method of payment.

Higson (1990a) is the only study which examines the choice of the method of payment using UK data. Using a sample of 373 completed takeovers over the period 1976 to 1987, he estimated Logit regressions comparing cash offers

²²Size was measured as the book value of total assets

with equity offers. Higson found a significant positive relationship between the probability of an equity offer, the size of the goodwill arising on the acquisition and the recent returns on the bidder's equity. Higson also found a significant positive relationship between the probability of a cash offer and the bidder's liquidity.

While Higson's study is important, the methodology adopted can be improved. Higson used Logit models with a dichotomous dependent variable equal to 1 for equity offers and 0 for cash offers. In order to get a two group classification Higson arbitrarily defined bids as equity offers when over 50% of the consideration was equity and as cash offers when over 50% of the consideration was cash. This classification rule did not recognise that a whole range of values is possible between 50% and 100%, if 100% is regarded as the theoretically pure definition of an all cash or all equity offer. Higson also used some cash flow variables as proxies for the free cash flow hypothesis. However no attempt was made to distinguish between bidders with high cash flow and those with free cash flow²³. This may partly explain why the cash flow variable was not significant in Higson's study.

Mayer & Walker (1992) used a sample of 181 bids over the period 1979-1990. This is the first study that moves away from the traditional 2 group Logit model and uses a methodology in which bids with a mixture of cash and equity

²³Cash flow is only free if the firm has run out of positive NPV projects (Jensen, 1986). Hence a firm can have high cash flow which is not free provided the firm has got profitable investment opportunities.

can be handled easily by the statistical model (i.e., the Two Limit Tobit Model, see Section 4.2.1). They found a significant positive correlation between the probability of a cash offer, the fraction of shares held by managers in the bidder and the bidder's liquidity.

Smith & Jennings (1993) examined whether information asymmetry between the bidder and the target affected the choice of payment method (see Section 2.4). They used the following variables as proxies for the uncertainty surrounding the value of the bidder's and the target's assets:- coefficient of variation of analyst forecast of the firm's earnings, number of analysts making an earnings forecast about the firm, relative size of the bidder to the target. Using a sample of 140 acquisitions occurring over the period 1979 to 1987, they estimated Logit regressions comparing equity offers and cash offers. Although the variables used as proxies for information asymmetry had the predicted sign none was statistically significant. Additionally they found that the likelihood of a cash offer was significantly positively related to the potential value of stepping-up the target's assets, the proportion of the bidder's shares held by management and competition from other bidders. They concluded that the weakness of their results regarding the information asymmetry variables could be due to the substantial noise in the proxies for unobservable private information.

There is an alternative explanation for the weak results in Smith & Jennings (1993). The discussion in

Section 2.4 suggests that information asymmetry on its own does not affect the method of payment. It is the possible overvaluation of a bidder resulting information asymmetry that causes the acquiring managers to offer equity. Similarly it is the desire of a bidder to avoid overpaying for the target, which results in an equity offer. When investors are not fully informed about the value of a firm (ie, there is information asymmetry in the market) the firm could be either overvalued or undervalued. If information asymmetry causes a firm to be undervalued, we would expect to observe a cash offer. In their proxies Smith & Jennings measure the level of information asymmetry, they are not measuring the over or under valuation in the bidder and the target, which is what drives the use of equity as the method of payment.

The most significant methodological shortcoming in the existing literature is the use of the single equation Logit model. The problems with this model have been discussed in Section 1.2.4.

2.13. Conclusion

In this chapter we have reviewed the literature concerned with factors likely to influence bidders in their choice of payment currency. The main picture that emerges is that the determinants of the method of payment in corporate acquisitions are diverse and complex. No single theoretical model can adequately encompass all these factors. A summary of the variables identified by the

Table 2.1
Summary of factors influencing the method of payment in corporate acquisitions.

Variable	Impact on the method of payment	Previous empirical evidence
Choice of accounting policy	Use of merger accounting requires at least 90% of the consideration as equity.	Not previously examined.
Relative size of the bidder to the target	To reduce valuation risk, relatively large targets are acquired via an equity offer.	US: Not significant in Smith & Jennings (1993). UK: Not significant in Higson (1990a).
Overvaluation of the bidder	When the bidder's managers believe that their shares are overvalued, they will make an equity offer.	Not previously examined.
Capital gains tax payable by target shareholders	When the potential CGT payable by target shareholders is large, bidders can avoid paying a CGT compensation premium with an equity offer.	US: Not significant in Niden (1988) and Smith & Jennings (1993). UK: Not significant in Higson (1990a).
Managerial shareholding in the bidder	With a large managerial shareholding, investments are financed with cash in order to avoid a dilution of managerial control.	US: Significant in Amihud et al (1990), Mayer & Walker (1992) and Smith & Jennings (1993). UK: Not previously examined.
External blockholding in the bidder	To avoid a dilution of shares held by large external blockholders investments are financed by cash.	Not previously examined.
Conditions in the capital market	With rising share prices, equity financing of new investments is easier.	US: Not previously examined. UK: Significant in Higson (1990a).

Table 2.1 (Continued)
Summary of factors influencing the method of payment in corporate acquisitions.

Variable	Impact on the method of payment	Previous empirical evidence
Capital structure of the bidder	With a high level of gearing, bidders will find it more difficult to raise the funds necessary to finance a cash offer	US: Not significant in Hansen (1987) and Mayer & Walker (1992). UK: Significant in Higson (1990a).
Capital structure of the target	Bidders can free ride on the external monitoring of targets with high gearing. This reduces the bidder's valuation risk and encourages cash offers.	US: Significant with wrong sign in Mayer & Walker (1992). UK: Not previously examined.
Growth opportunities in the bidder and the target	In order to avoid sharing the NPV from the exercise of future growth options with creditors, a merger involving firms with growth opportunities is more likely to be financed with equity.	Not previously examined.
Cash resources of the bidder	Bidders with liquid assets will find it easier to finance cash offers.	US: Significant in Mayer & Walker (1992), not significant in Smith & Jennings (1993). UK: Significant in Higson (1990a).
Cash resources of the target	If the target is highly liquid, its cash resources can be used to help finance a cash offer.	US: Not significant in Mayer & Walker (1992). UK: Not previously examined.
Bidder's free cash flow	Bidders with free cash flow will make cash acquisitions rather than return free cash flow to shareholders	Not previously examined.
Resistance by the target's management	A cash offer will be more successful in overcoming resistance by target managers.	US: Not previously examined. UK: Not significant in Higson (1990a) and Sudarsanam (1994b)

literature review is provided in Table 2.1.

A robust result which emerges from the US based studies on the determinants of the method of payment is the negative relationship between the use of equity and insider control of voting rights (Amihud et al, 1990; Mayer & Walker, 1992; Smith & Jennings, 1993). This issue has not been examined by any UK studies.

The literature review has revealed a number of variables which have been found to be related to the financing decisions of the firms in other areas, but which have not been studied within the context of corporate acquisitions: (i) choice of accounting policy (ii) dilution of shares held by external blockholders (iii) free cash flow of the bidder (vi) growth opportunities in the bidder.

Our review reveals a disturbing lack of UK based empirical literature on the determinants of the financing method in acquisition. The only UK based study in this area is Higson (1990a). Additionally some variable which have a significant impact on acquisition financing in the US literature have not been tested in the UK: (i) managerial shareholding in the bidder (ii) capital structure of the target (iii) liquid resources of the target. Later in this thesis we attempt to fill this gap in the literature.

In this chapter we have argued that the method of payment and the choice of accounting policy are jointly determined (Section 2.3. above). This interaction requires the use of a simultaneous equations framework which necessitates that we identify the determinants of the

accounting policy choice in corporate acquisitions. The next chapter discusses these factors.

CHAPTER 3.

DETERMINANTS OF THE ACCOUNTING METHOD IN MERGERS AND ACQUISITIONS :- THEORY & EMPIRICAL EVIDENCE.

3.1. Introduction

There are two methods of accounting for a business combination i.e, merger or acquisition accounting. While the cash flows under both methods may be the same and, therefore, the choice of accounting method may have little valuation impact on the firm's securities, managers may still perceive relatively greater benefits from one accounting method than from the other.

There are several possible economic motives for managerial preference for a particular accounting method. Among these are: the impact of accounting numbers on management compensation, dividend restrictions from debt covenants, restriction on borrowing capacity imposed by such covenants and the political cost of reporting high earnings. Since business combinations give rise to monopoly concerns and tend to attract antitrust regulatory scrutiny, the political cost of reporting higher earnings is particularly important in the choice between merger and acquisition accounting.

One of the key determinants of the accounting policy is the method of payment. This relationship is a direct result of the rule which requires that at least 90% of the fair value of the total consideration offered by the bidder must be equity in order to qualify to use merger accounting

(SSAP 23)¹. Conversely, this 90% rule implies that the method of payment is affected by the choice of accounting policy.

In this chapter we discuss the relative merits of acquisition and merger accounting and the factors which are likely to influence the choice of accounting policy by the bidder's managers.

3.2. UK rules governing the method of accounting for corporate acquisitions

Accounting for business combinations is a topic which has caused considerable controversy in the UK. The two main methods of accounting for a business combination are acquisition (purchase) or merger (pooling) accounting. Traditionally the acquisition method was the main technique of accounting for business combinations. However in the 1960s, as a result of its popularity in the USA, the merger method began to find favour in the UK. ED 3 'Accounting for acquisitions and mergers', issued in January 1971 was the first attempt to specify the situations in which each method could be used.

ED 3 was never converted into an accounting standard, because there were doubts as to the legality of merger accounting. As the merger method required that shares be recorded at nominal value rather than their market values,

¹SSAP 23 (issued in April 1985) which was the relevant standard operating for most of the sample period (1/1/80 to 31/12/90) covered by this thesis was withdrawn in September 1994 and replaced by Financial Reporting Standard (FRS) 6.

it appeared to contravene Section 56 of the 1948 Companies Act. The illegality of the merger method was finally confirmed in the case of *Shearer vs Bercaín Ltd 1980*.

The 1981 Companies Act legalized merger accounting by providing that a share premium account need not be set up for any equity shares issued as consideration where one company has acquired at least 90% of the equity in another company. This provision permits but does not require the use of merger accounting.

3.2.1. Statement of Standard Accounting Practice (SSAP) 23

Following the 1981 Companies Act, the Accounting Standards Committee issued SSAP 23 in April 1985. SSAP 23 requires that all business combinations should be accounted for using acquisition accounting unless all of the following conditions have been complied with:-

(1) there must have been an offer to the shareholders of the target for all the shares and all the voting shares not held by the bidder at the date of the offer;

(2) the offer must result in the bidder securing ownership of at least 90% of all equity shares (taking each class of equity separately) and at least 90% of the votes of the target;

(3) prior to the offer, the bidder must not hold more than 20% of either the equity or the votes of the target;

(4) at least 90% of the fair value of the total consideration given by the bidder to secure ownership of the equity and the equity non-voting shares of the target

must be in the form of the bidder's equity.

The 1989 Companies Act now gives legal status to the rules governing the use of merger accounting contained in SSAP 23. However in one respect, the 1989 Act is more demanding in defining the conditions under which merger accounting may be used. For merger accounting to apply, the cash element of the total consideration should not exceed 10% of the nominal value of the shares issued as opposed to 10% of the fair value of total consideration which is the looser condition specified by SSAP 23.

These rules would imply that merger accounting is only applicable where the method of payment offered by the bidder is primarily equity. Cash consideration would be consistent with acquisition accounting. However devices exist for ensuring that the conditions for merger accounting are satisfied even though the method of payment received by target shareholders is primarily cash.

In the 1986 Hanson bid for Imperial Group or Turner & Newall's bid for AE, nominee companies funded by the bidder were sent into the market to acquire the target's shares for cash. These nominee companies then accepted the bidder's equity in a general offer and were subsequently wound up. The bidder's shares held by these nominee companies were placed in the market. Since the bidder had made an equity rather than a cash offer, it could obtain the benefits of merger accounting.

Vendor rights and vendor placing schemes (see Section 2.2.1) also allow companies to violate the spirit of the

SSAP 23 rules. These schemes allow bidders wishing to buy a company for a cash consideration, but who also wish to use merger accounting to have their cake and eat it. The bidder would make a share for share exchange offer, while its merchant bankers would arrange for the target shareholders to convert the shares they receive into cash, either by selling them to a third party (vendor placing) or selling the shares to the bidder's own shareholders (vendor rights). The final result is that shares are purchased for cash while technically merger accounting can still be used.

Since merger accounting is not available, if the bidder holds more than 20% of the target's shares prior to the offer, bidders who fall foul of this rule, can temporarily 'warehouse' the offending shares with their bankers or a friendly third party and buy them back in a general offer.

3.2.2. Financial Reporting Standard (FRS) 6

In September 1994, the Accounting Standards Board (ASB) issued FRS 6 and withdrew SSAP 23. FRS 6 addresses some of the abuses of SSAP 23 discussed above and limits the use of merger accounting. FRS 6 states that merger accounting can only be used for a merger which is defined as:-

"A business combination that results in the creation of a new reporting entity formed from the combining parties, in which the shareholders of the combining entities come together in a partnership for the mutual sharing of risks and benefits of the combined entity, and in which no party to the combination in substance obtains control over any other, or is otherwise seen to be dominant, whether by virtue of the proportion of

its shareholders' rights in the combined entity, the influence of its directors or otherwise."

The broad objective of FRS 6 is to limit the use of merger accounting to only those business combinations where the combining parties join together on an equal footing to form a new enterprise for their mutual benefit. The FRS contains five detailed criteria which must be met in order to use merger accounting:-

1) no party to the combination is portrayed as either acquirer or acquired;

2) the board of directors of all parties to the combination participate in the management of the combined entity;

3) no party to the combination dominates the other parties by virtue of its relative size;

4) the consideration received by equity shareholders of each party to the combination comprises primarily equity shares in the combined entity;

5) no equity shareholder of any of the combining entities retain any material interest in the future performance of only part of the combined entity.

Unlike SSAP 23, FRS 6 requires that if these conditions are satisfied, then merger accounting is mandatory.

3.2.3. Acquisition versus merger accounting

The main differences between acquisition and merger accounting are summarised below:

ACQUISITION ACCOUNTING

Investment in the target is recorded in the bidder's accounts at the fair value of the consideration paid.

A share premium account arises if the method of payment used is equity unless merger relief is available.

Target's results are consolidated from the date of acquisition.

Target's net assets at the date of acquisition have to be restated at fair value before consolidation in the group's accounts.

Goodwill should be recognised as the difference between the fair value of the consideration given and the fair value of the separable net assets acquired.

Pre-acquisition reserves of the target cannot be treated as distributable profits by the bidder.

MERGER ACCOUNTING

Investment in the target is recorded in the bidder's accounts at the nominal value of the shares issued.

No share premium account arises.

Target's results are consolidated for the whole of the year in which the acquisition took place.

Restatement of the target's net assets is not necessary.

Goodwill is not recognised. Any difference between the nominal values of the shares issued and the shares acquired is treated as a reserve arising on consolidation.

All reserves are distributable irrespective of whether they are pre or post acquisition reserves.

3.3. Implications of UK accounting rules for the choice of accounting policy

The implications of the differences between merger and acquisition accounting for the choice of accounting policy by the bidder are discussed below.

3.3.1. Accounting treatment of goodwill

SSAP 23 provides for 2 methods of eliminating goodwill in the consolidated accounts:

(1) Goodwill is written off immediately in the balance sheet against reserves.

(2) Goodwill is capitalised and amortised through the profit and loss account over its economic life.

The amount of goodwill to be eliminated can be subject to a considerable amount of ingenuity on the part of companies. The requirement to ascribe fair values to the separable net assets of the target can result in bidders making significant adjustments to the target's net assets in the year of acquisition with the purpose of benefiting earnings in future years. Provisions and write-downs can be made against the assets of the target prior to consolidation, thereby increasing the amount of goodwill². If the goodwill is then eliminated against reserves, it is excluded from the bidder's profit and loss account. Subsequent expenses are then written off to such provisions in the balance sheet rather than to the profit & loss account. Any over-provision being released to the P&L account at a later date, if the original provisions prove to be excessive.

The immediate write-off of goodwill has the advantage that future earnings are not affected by the annual charge

²Statement of Standard Accounting Practice No 22, Paragraph 14, permits the setting up of provisions at the time of an acquisition in respect of anticipated future losses or costs of reorganisation. Such provisions reduce the net assets of the target and increase the value of goodwill. Grinyer et al (1991) found that the use of provisions to write down the cost of assets in the balance sheet was negatively related to the bidder's gearing ratio. This suggests that bidders' with a high level of gearing preferred to assign high values to their targets' tangible assets in order to help reduce gearing ratios in the post acquisition group balance sheet. The setting up of provisions for future losses and reorganisation costs expected to be incurred as a result of the acquisition is now prohibited by FRS 7 issued in September 1994.

for goodwill amortisation. However the goodwill write-off against reserves will deplete the balance sheet. The acquisition of J Walter Thompson by WPP in 1986 all but eliminated WPP's shareholders' funds. This can result in a reduction in borrowing capacity and breaches of existing loan covenants. In order to repair the damage done to the balance sheet by the goodwill write-off, some companies have resorted to valuing intangible assets like brands or trade marks. In 1986 when Guinness acquired Distillers, it had to write off £1.39bn by way of goodwill. In 1989, it simply added back £1.38bn by way of brand valuation.

The amortisation of goodwill through the P&L account has the clear disadvantage that future earnings are adversely affected. Consequently most bidders may find this method unacceptable. The UK is unique in allowing an immediate write off against reserves. In the USA, it is mandatory that goodwill is amortised through the P&L account over a maximum period of 40 years, while in Continental Europe the mandatory write off period is between 10 to 20 years. Given the international dimension of takeover activity, foreign companies have argued that UK companies have an unfair advantage when bidding against foreign competitors, because the immediate write off method leaves their future earnings unaffected (Ivancevich, 1993).

Under acquisition accounting goodwill should be recognised and somehow it has to be eliminated. Merger accounting however avoids all the problems associated with eliminating goodwill. Where an acquisition will result in

the recognition of a large element of goodwill, the bidder has the incentive to structure the method of payment so as to obtain the benefits of merger accounting and avoid the recognition of goodwill.

3.3.2. Merger relief

The desire to use merger accounting as a route to avoiding the problem of goodwill may not be the only reason why bidders may choose to offer equity as a method of payment. Prior to the 1981 Companies Act only the consolidated revenue reserves could be used to write off goodwill. The 1981 Companies Act introduced the concept of "Merger Relief". Under the merger relief provisions where a bidder issues shares to acquire a subsidiary and the shares issued have a market value greater than the nominal value, then the difference can be credited to a merger reserve account rather than the usual share premium account. Any goodwill arising on the acquisition can be written off against the merger reserve.

The following conditions have to be satisfied in order to obtain relief from the requirement to create a share premium account:

(1) the bidder must secure ownership of at least 90% of each class of equity in the target;

(2) at least part of the consideration offered by the bidder must be in the form of equity shares.

Since there is no requirement that a minimum percentage of the total consideration paid by the bidder

must be in the form of equity, the size of the merger reserve against which any goodwill can be written off will be directly proportional to the amount of equity in the final consideration.

It is not immediately clear that the use of the merger reserve account to write off goodwill has any advantage to the bidder. If goodwill arises on consolidation, then immediate write off against reserves has no effect on distributable profits³. Consequently it is arguable whether the elimination of goodwill against merger reserve as opposed to the profit and loss reserve results in any advantage to the bidder. However there appears to be a belief amongst company directors that a large profit and loss reserve in the group's consolidated balance sheet is a sign of good corporate health and therefore this reserve should not be depleted by the write off of goodwill. (See Holgate, 1990: p.20).

The belief that writing off goodwill against the profit and loss reserve gives an unfavourable impression to investors has led to the practice in the UK of eliminating goodwill via a dangling debit when a merger reserve account is not available. Under this technique a new reserve is started with a zero balance and goodwill is written off

³The distributable profits of the group depend on the size of the accumulated profit and loss reserve in the holding company's balance sheet. This is not affected by writing off goodwill on consolidation against the group's accumulated profit and loss reserve.

against it. The result is of course a debit balance⁴. This method has the advantage that the user is able to see the total of goodwill on all acquisitions since the policy was first adopted.

3.3.3. Bidder's access to the target's pre acquisition reserves

Pre acquisition reserves refer to the accumulated revenue reserves of the target at the date of the acquisition. Under acquisition accounting and prior to the 1981 Companies Act, the pre acquisition reserves of the target have to be capitalised by the bidder and are not available for distribution in the future as dividends by the bidder. Any dividend received by the bidder out of the target's pre acquisition reserves is used to write down the cost of its investment in the target. The bidder cannot treat such dividends as realized profits which could subsequently be distributed to its own shareholders.

The 1981 Companies Act, now reiterated in Schedule 9 of the 1985 Companies Act, introduced changes to the treatment of dividends paid out of pre-acquisition profits. Where a dividend is paid out of pre-acquisition profits, it does not necessarily have to be used to write down the cost

⁴LIT Holdings Plc used acquisition accounting with a dangling debit to account for its takeover of Johnson Fry Plc in 1988. In its last balance sheet prior to the acquisition, LIT had total capital and reserves of £43.7m including accumulated revenue reserves of £13.1. Goodwill recognised from the takeover was £24.1m which would have eliminated all of LIT's revenue reserve if goodwill had been written off to the revenue reserve account. Presumably to avoid disclosing a negative figure for accumulated revenue reserve LIT wrote off goodwill via a dangling debit.

of the investment in the target, except to the extent that it is necessary to provide for a permanent diminution in the value of the investment in the target. If such a provision is not necessary, dividends received out of pre-acquisition reserves can be treated as realised profits in the hands of the bidder and can legally be distributed to the bidder's shareholders.

This change in the law regarding the treatment of pre acquisition reserves, legalised the merger accounting rules which allow dividends paid out of pre acquisition reserves to be treated as distributable profits by the bidder.

Where the bidder is likely to need the pre acquisition reserves of the target for paying future dividends to its own shareholders, the probability of using merger accounting in the consolidated accounts will be an increasing function of the size of the target's pre acquisition reserves. Bidders with declining dividend cover or a high ratio of current dividends to revenue reserve may prefer merger to acquisition accounting where the target is relatively liquid and has significant pre acquisition reserves.

3.3.4. Depreciable fixed assets and post merger profits

Acquisition accounting requires that when consolidating a subsidiary's activities for the first time in the parent company's accounts, all the assets of the subsidiary must be restated to their fair value at the date of the acquisition (Companies Act 1985, Schedule 4A and

SSAP 23). The requirement to restate assets to their fair value can have an impact on the future reported profits of the group. In order to analyse this potential impact we must distinguish between two broad classes of depreciable fixed assets.

1) **"Value Increasing Depreciable Fixed Assets"**
(VIDFA): These are depreciable fixed assets whose values are likely to increase over time. These assets would have a fair value which is likely to be greater than the reported net book values eg, property which is not classed as an investment property and brands.

2) **"Value Decreasing Depreciable Fixed Assets"**
(VDDFA): These are depreciable fixed assets whose values are likely to decrease over time. These assets would have a fair value which is likely to be lower than the reported net book values eg, plant and machinery.

When VIDFA are restated at fair value this can have a negative impact on the future reported profits as higher depreciation charges are passed through the profit and loss account. Restatement of VDDFA will have a positive impact on future profits, since future depreciation charges will be lower. Nurnberg and Sweeney (1989) show that when the fair value of assets is increasing, higher post combination profits are reported under merger accounting, while decreasing fair asset values result in acquisition accounting showing higher post combination profits.

The probability of the bidder adopting merger accounting is likely to be an increasing function of the

proportion of the target's net worth which is composed of value increasing depreciable assets and a decreasing function of the value decreasing depreciable fixed assets included in the target's net worth.

3.3.5. Enhancing current period earnings

Acquisition accounting requires that the target's activities can only be consolidated from the date of acquisition on a time apportionment basis. This implies that in the year of acquisition only that proportion of the target's profits which has accrued from the date of acquisition can be included in group profits. Merger accounting, however, treats both the bidder and the target as one single entity for the entire year in which the acquisition took place (SSAP 23). A bidder with small profits may wish to utilise the current year's pre-acquisition profits of the target in boosting the reported profits of the group. Merger accounting offers the advantage of reporting higher profits, especially in combinations involving a low profit bidder and a high profit target.

By making an equity offer bidders may be able to "buy" earnings and incorporate the target's full year's results in the consolidated P&L account even if the acquisition takes place at the end of the relevant accounting period. Although the reported earnings may rise so does the number of shareholders, hence the impact on earnings per share may not be uniform across all bidders. The effect of the

acquisition on the EPS depends on the relative price earnings ratio and the share exchange ratio (Sudarsanam, 1990a).

Where the level of the target's earnings in the year of acquisition is a consideration for the bidder the probability of the latter using merger accounting is an increasing function of the profitability of the target relative to the bidder.

3.3.6. High reported earnings and their political cost

Watts & Zimmerman (1978) argue that the "political costs" of reporting large profit numbers increases with the size of the firm. Large firms reporting maximum profit figures are more likely to face increased regulatory pressure in terms of challenges to their acquisition programmes and pricing policies from the anti-monopoly agencies. In order to obtain a quiet life large firms are more likely to choose conservative accounting policies which do not result in the reporting of maximum profits. (Watts & Zimmerman, 1978; Hagerman & Zmijewski, 1979; Bowen, Lacy & Noreen, 1981; Zmijewski & Hagerman, 1981; Daley & Vigeland, 1983).

In the UK, it is not immediately obvious whether the reporting advantage lies with merger or acquisition accounting. Since goodwill can be eliminated against reserves, the future accounting profits of the group are not affected by the recognition of goodwill. In the year of the combination, the consolidation of pre-acquisition

earnings favours merger accounting. Conversely acquisition accounting offers the opportunity to create provisions in the combination year which can then be subsequently fed back to inflate earnings in future years⁵. Additionally acquisition accounting allows the bidder to write down the value of the target's tangible fixed assets prior to consolidation which reduces future depreciation charge with a favourable impact on future profits.

3.3.7. Goodwill accounting and breach of debt covenants

In order to control the agency conflict between shareholders and bondholders, debt agreements have restrictive covenants which limit the financing, investment and dividend policies of the firm (Smith & Warner, 1979). Citron (1992c) found that these restrictions usually circumscribe the ability of managers to increase the gearing of the company and dispose of assets.

Since generally accepted accounting principles are used in the measurement of these accounting based covenants, the closer a firm is to breaching a specific covenant, the more likely it is that it will adopt accounting policies to help avoid a breach of the particular covenant.

A number of empirical studies have demonstrated that a high debt/equity ratio is associated with the adoption of income increasing accounting policies (Dhaliwal, 1980;

⁵The creation of provisions for future losses or reorganisation costs at the date of acquisition is no longer permitted under FRS 7.

Holthausen, 1981; Bowen et al, 1981; Lilien & Pastena, 1982; Daley & Viegland, 1983; Christie, 1990). Implicit in all these studies is the assumption that a high debt/equity ratio is a reasonable proxy for closeness to breach of accounting based covenants.

Since the elimination of goodwill under acquisition accounting will eventually result in the reduction of the bidder's net worth and possible violation of gearing covenant restrictions, bidders with high gearing may have a preference for merger accounting. However Citron (1992b) suggests that the impact of gearing covenant restrictions on the choice of accounting policy in the UK may not be significant. He finds that where breach of a covenant is caused by goodwill write off, the relaxation of the covenant is the most likely response of the lenders. Additionally he finds that it is not uncommon for loan agreements in the UK to provide for goodwill on acquisitions to be included in net worth for the purpose of calculating gearing.

3.3.8. Summary of implications of accounting rules for the choice of accounting policy

The above discussion suggests that the choice of merger accounting by the bidder is:

i) affected by the method of payment, due to the rule that equity must form at least 90% of the total consideration paid in order to use merger accounting;

ii) positively related to the size of goodwill

realisable in the acquisition (Section 3.3.1), proportion of the target's assets composed of value increasing depreciable fixed assets (Section 3.3.4), size of target's pre acquisition reserves (Section 3.3.3), relative profitability of the bidder to the target (Section 3.3.5) and bidder's gearing (Section 3.3.7);

iii) negatively related to the size of the bidder and the target (Section 3.3.6) and proportion of the target's assets composed of value decreasing depreciable fixed assets (Section 3.3.4).

3.4. Empirical evidence on the accounting policy choice

The preponderance of empirical evidence, on the determinants of accounting policy choice, has come mainly from the US. Accounting for business combinations in the US is governed by Accounting Principles Board Opinion 16 (APBO 16). APBO 16 is similar to SSAP 23 in the UK in that it requires that at least 90% of the consideration paid must be equity in order to use merger accounting. However there is a sharp difference in the prescribed treatment of goodwill under acquisition accounting between the US and the UK rules. APBO 16 requires that in the US any goodwill recognised under acquisition accounting must be amortised through the P&L account over a maximum period of 40 years, while in the UK bidders have a choice of either amortising goodwill through the P&L account or writing it off against reserves.

In the US bidders face a choice between not

recognising goodwill (merger accounting) and amortising goodwill against future profits (acquisition accounting). Although in the UK goodwill is recognised under acquisition accounting, its elimination does not necessarily depress future profits. The difference between the US and the UK treatment of goodwill could reduce the relevance of US results for understanding accounting policy choice decisions by UK bidders.

Because the US accounting rules require that goodwill must be amortised through the P&L account, most of these studies have concentrated on examining the impact of goodwill on the merger/acquisition accounting choice.

Gagnon (1967) was the first study to investigate whether under certain conditions a business combination would be accounted for using merger or acquisition accounting. Gagnon's study was driven by an income maximising hypothesis. He argued that the choice between merger and acquisition accounting could be used to manipulate future income, because different asset values are reported under the two methods. If the price paid for the target (P) exceeds the book value of the target's assets (BV) merger accounting would minimise the asset value reported by the combined entity since goodwill is not recognised under merger accounting. Where P is less than BV then acquisition accounting would minimise asset values.

Gagnon suggested that the method which minimises asset values would maximise profit, since this reduces future charges against income. Gagnon defined a predictor variable

:-

$$K = \frac{P - BV}{E}$$

where P = price paid for the target

BV = Book Value of the target's assets.

E = Expected earnings of the combined firm⁶.

Gagnon's hypothesised that bidders would choose merger accounting when K was positive and acquisition accounting when K was negative. His sample consisted of 219 equity offers from the years 1955 and 1956. Gagnon found that, where P-BV was positive, the probability of merger accounting being used was positively related to the size of K. However contrary to prior expectation his results also showed a similar positive association when P-BV was negative. Gagnon concluded that K was a good predictor of accounting choice only when P-BV was positive. Although he discusses other variables which could influence the choice between merger and acquisition accounting (eg size of the bidder) Gagnon did not present the results of any multivariate regressions.

In discussion articles both Sapienza (1967) and Wyatt (1967) criticise the Gagnon study for the choice of time period used. Sapienza points out that, in 1955, the understanding of merger accounting among practitioners and

⁶Expected earnings is defined as the market value weighted average of the bidder's and target's earnings over the ten years preceding the bid multiplied by the accounting rate of return over the same 10 year period.

academics was limited. Wyatt observed that over the period to 1967, there had been a substantial erosion of the stringent guidelines for using merger accounting. As a consequence there was a trend towards merger accounting with the possible result that combinations accounted for as acquisitions in 1955-56 would probably be treated as mergers in 1967, when Gagnon's study was published, thus questioning the relevance of results based on 1950's data for researchers and practitioners in later periods.

Copeland & Wojdak (1969) addressed the time criticism directed at Gagnon's study. Using a sample of 118 randomly selected equity offers over the period July 1966 to July 1967, they found that there had indeed been a significant trend towards increased use of merger accounting since the sample period chosen by Gagnon. 51% of Gagnon's sample had used merger accounting compared to 85% for Copeland and Wojdak. Copeland and Wojdak also found that when P-BV was positive 92.66% of bidders chose merger accounting, while when P-BV is negative, only 55.55% of bidders chose acquisition accounting. The results indicate that when P-BV was positive there was a greater probability that the bidder would chose merger accounting. When P-BV was negative the results did not establish any clear preference by bidders between merger and acquisition accounting.

Anderson & Louderback (1975) investigated the impact of Accounting Principles Board Opinion 16 (APBO 16) on the choice of accounting method. In October 1970, APBO 16 introduced the rule that the bidder had to acquire at least

90% of the target's shares via an exchange of voting shares in order to qualify for merger accounting. They wanted to examine whether the results of Gagnon and Copeland & Wojdak were still applicable in the post APBO 16 period. The sample consisted of 114 takeovers in the pre APBO 16 period and 64 takeovers in the post APBO 16 period. They found that when P-BV was positive about 87% of bidders chose merger accounting in both the pre and post APBO 16 period. When P-BV was negative 66% of bidders chose acquisition accounting in both the pre and post APBO 16 period. They concluded that the stricter rules introduced by APBO 16 did not significantly influence the choice of accounting method by the bidder.

Nathan (1988) investigated whether bidders were willing to pay higher bid premia in order to obtain the benefits of merger accounting. Nathan suggested that the conditions for using merger accounting contained in APBO 16 made it impossible to use merger accounting without the co-operation of the target's management⁷. If bidders prefer to use merger accounting then the target may demand a higher premium for its co-operation. Using a sample of 461 takeovers over the period 1963 to 1978, Nathan regressed the bid premium on proxies for potential goodwill write off

⁷Unfortunately, Nathan did not clarify his argument, that the co-operation of target managers was required for the bidder to use pooling accounting in the US. The use of pooling accounting is not barred as a result of resistance by target managers under the rules laid out in APBO 16. Additionally, Nathan's argument suggests that target bid premia will be higher in friendly bids than in hostile bids. This is inconsistent with the evidence from Huang & Walkling (1987); Franks, Harris & Mayer (1988); Franks & Mayer (1993).

and several control variables⁸. Contrary to his hypothesis that goodwill was positively related with bid premium⁹, Nathan found a significant negative relationship between goodwill write off and bid premium.

To explain this result Nathan suggested that the goodwill write off variable was a proxy for the target's q ratio¹⁰. If a low q ratio was a sign of inefficient management, then low q targets may offer greater scope for realising post merger gains and hence attract higher bid premiums. Although bidders may be willing to pay higher bid premium in order to use merger accounting, the relationship between q ratio and bid premium overwhelmed any positive relationship between goodwill and bid premium. Similar to Gagnon (1967), Nathan finds that as the potential goodwill to be written off rises, the proportion of bidders using merger accounting also rises. This result was consistent in both the pre APBO 16 and post APBO 16 period.

The results of studies that have examined the impact of goodwill on the choice of accounting method are summarised in Table 3.1. The results generally support the proposition that when goodwill is positive bidders choose merger accounting in order to avoid the reduction in future

⁸These regressions are only meaningful, if we accept Nathan's argument that bidders will offer a higher bid premium in order to obtain the benefits of merger accounting.

⁹Nathan's proposition is that a large goodwill figure will induce the bidder to choose merger accounting. If the target demands a larger premium in order to cooperate with the bidder, then a positive relationship will exist between goodwill and bid premium.

¹⁰Nathan's proposition is that, a low q ratio is synonymous with a small goodwill figure.

Table 3.1.

Summary of studies testing the impact of goodwill on the choice of accounting method.

MA and AA refer to the number of bidders in the sample using merger and acquisition accounting respectively. "Maximise Income" refers to the proportion of observations with accounting policies consistent with the maximisation of income as specified by Gagnon (1967). Income maximisation implies the use of merger accounting when goodwill is positive and acquisition accounting when goodwill is negative.

Study	Time Period	Goodwill is positive			Goodwill is negative			Total	
		MA	AA	Maximise Income	MA	AA	Maximise Income	Sample Size	Maximise Income
Gagnon (1967)	1955 - 1956	94	90	51.09%	18	17	48.57%	219	50.68%
Copeland & Wojdak (1969)	1/7/1966 - 30/6/1967	101	8	92.66%	4	5	55.55%	118	89.83%
Anderson & Louderback (1975)	1967 - 31/10/1970	100	8	92.59%	2	4	66.66%	114	91.22%
Anderson & Louderback (1975)	1/11/1970 - 1974	53	8	86.89%	1	2	66.66%	64	85.94%
Nathan (1988)	1963 - 31/10/1970	141	4	97.24%	23	6	20.69%	174	84.48%
Nathan (1988)	1/11/1970 - 1978	85	8	91.40%	18	16	47.06%	127	79.52%

earnings caused by the amortisation of goodwill through the P&L account. However the alternative proposition that when goodwill is negative bidders choose acquisition accounting is not supported. The validity of the results when goodwill is negative is questionable since the samples sizes are small.

Because the above studies all concentrate exclusively on the impact of goodwill on the choice of accounting policy, they are all affected by the omitted variables problem which limits their usefulness in providing insights into how bidders choose the method of accounting for business combinations. Higson (1990b) uses a broader range of explanatory variables hence reducing the impact of omitted variables on his results.

Higson (1990b) is the only study investigating the choice of accounting method in takeovers using a multivariate regression methodology. In this regard Higson improved on the previous US studies which had focused exclusively on goodwill. He used a sample of 69 takeovers where the bidder was qualified to use merger accounting over the period 1976-87, and performed a binary Logit regression with accounting method as the dependent variable. Higson's model showed that the relative profitability of the target had a significant and positive impact on the use of merger accounting. With a single equation Logit model, Higson was forced to use selective sampling (i.e, pure equity bids) to control for the impact of the method of payment on the choice of accounting

policy. Additionally Higson's study did not test for the impact of political cost (see Section 3.3.6) and debt covenants (see Section 3.3.7) on the choice of accounting policy. In this regard Higson's study is still affected by the omitted variables problem.

Robinson and Shane (1990) investigated the impact of the accounting method chosen by the bidder on the premium paid to the target shareholders. They suggested that where a takeover was structured to obtain significant economic benefits from the accounting method¹¹, then the benefits derived from using that accounting method may be reflected in the bid premia paid for target shares.

Using a sample of 95 pure equity offers over the period 1972-82, they regressed the bid premium on the method of accounting and several control variables. Both the univariate and multivariate tests showed that the bid premium to target shareholders was higher when bidders used merger accounting relative to acquisition accounting. The interpretation of this result is, however confounded by the problem that the method of accounting and the bid premium may be jointly determined.

A statistical association between accounting method and bid premium may indicate that bidders derive economic benefits from using merger accounting which is

¹¹See Robinson & Shane (1990: p.28) for a discussion of the possible economic benefits resulting from using merger accounting. These include relaxation of restrictions on dividend and financing policies imposed by debt covenants, increases in managerial compensation, resulting from the higher profits reported under merger accounting.

correspondingly reflected in the bid premium. Alternatively it may indicate that high value targets systematically attract higher bid premium, consequently increasing the probability of using merger accounting due to the resultant increase in the size of goodwill write off. The regressions in Robinson and Shane do not offer any insights into disentangling the reported association between method of accounting and bid premium.

As a brief summary, the above review shows that:-

1) when goodwill is positive, bidders prefer to use merger accounting, although negative goodwill does not always lead to the use of acquisition accounting;

2) the majority of studies focus on the impact of goodwill on the choice of accounting policy. There is very little use of multivariate regression techniques to analyse jointly the influence of other relevant variables on the choice of accounting method;

3) the bid premium to target shareholders is higher when bidders use merger accounting than when bidders use acquisition accounting. However the interpretation of this relationship is not clear.

3.5. Earnings manipulation and market efficiency

Given the empirical evidence that capital markets are efficient (Foster, 1986: Chapters 9 and 11), should managers have a preference between the choice of merger and acquisition accounting?.

The discounted cash flow model suggests that the

market price of any security is the present value of its expected future cash flows discounted at the appropriate risk-adjusted rate. Since annual accounts report earnings and not cash flows an important question is whether the stock market values the effects of managerial decisions on cash flows or on earnings. If the market efficiently prices securities (ie, it only values cash flows), then investors should be indifferent between managerial choice of merger or acquisition accounting, since the choice of accounting method does not affect the cash flows resulting from the takeover.

Hong, Kaplan & Mandelker (1978) examined the effects of merger and acquisition accounting on the stock prices of bidders. Using a sample of equity offers over the period 1954-64, they compared the abnormal returns for a sample of 122 bidders who used merger accounting with 37 bidders who used acquisition accounting. Abnormal returns centred on two event periods were examined (i) the month of the first earnings announcement following the completion of the merger (ii) the merger announcement month.

Bidders using merger accounting did not display any statistically significant returns around either of the two event months¹². Bidders using acquisition accounting showed statistically significant positive returns around the month of merger announcement. These results do not suggest that

¹²Unfortunately the paper only presents the graphs for abnormal returns for the 12 months before and after the relevant event month. The actual abnormal returns calculated for the event month are not reported in the paper.

firms using merger accounting were able to benefit in terms of increased share price at the time of either merger or earnings announcement.

A number of other studies in a non takeover context have examined whether the stock market is deceived by changes in accounting policies, which are not accompanied by real economic changes in cash flows (Kaplan & Roll, 1972; Archibald, 1972; Ball, 1972; Sunder, 1973). These studies show that accounting policy changes which have no impact on the firm's cash flows do not affect the firm's share price (Foster, 1986: Chapter 11).

3.6. Managerial considerations and accounting policy choice

Despite the empirical evidence above that managers cannot increase the value of their firm by manipulating the accounting numbers (see Section 3.5) there are still several possible economic motives for managers to prefer merger to acquisition accounting.

Among these are: the restrictions on dividend payments and borrowing capacity imposed by debt covenants (see Section 3.10), the political costs of reporting high accounting earnings (see Section 3.9) and the impact of accounting numbers on managerial remuneration.

The remuneration of managers is linked to accounting numbers through the inclusion of profit related pay clauses in their compensation contracts. The purpose of these clauses is to align managerial interests with those of shareholders (Watts & Zimmerman, 1978; Sloan, 1993; Forbes

& Watson, 1993).

Murphy (1985) found that profit related pay accounted for over 25% of managerial compensation, while stock options account for around 10%. Jensen & Murphy (1990) and Lambert & Larcker (1987) found that managerial compensation was related to both changes in accounting earnings and stock price performance. However, in both studies accounting earnings had greater power in explaining cross sectional variations in cash compensation to managers than share prices.

Mangel & Singh (1993) found that the cash compensation to the chief executive officer in large US corporations was positively related to the firm's accounting return on equity, while in a study of UK Building Societies, Ingham & Thompson (1993) found that the salary received by the highest paid director was positively related to the return on assets and the growth in profitability. These studies confirm the existence of a link between managerial pay and the firm's accounting profit.

Where managerial compensation is dependent on the reported accounting numbers, then irrespective of a managerial belief in efficient markets, managers will not regard the choice of accounting policy as an insignificant detail in the firm's acquisition strategy.

3.7. Conclusion

In this chapter we reviewed the literature on the determinants of the accounting policy in corporate

acquisitions. A summary of the determinants of accounting policy in corporate acquisitions is provided in Table 3.2.

US based studies all adopt a univariate approach in their analysis and focus exclusively on the importance of goodwill and the desire by the bidder to choose merger accounting as a means of avoiding the recognition of goodwill. This evidence suggests that when goodwill is positive bidders are more likely to choose merger accounting. However when goodwill is negative there is no clear preference by bidders for a particular accounting method.

There is very little UK based evidence on the determinants of the accounting policy in takeovers. Higson (1990b) which is the only relevant UK study in this area found that goodwill was not a significant determinant of accounting policy. Higson found that the main determinant of the accounting policy was the relative profitability of the target to the bidder.

One of the main criticisms of the existing literature is the omission of relevant variables from the analysis. Some variables (e.g, size and gearing) which have been found to be significant determinants of accounting policy in other contexts have not been tested in relation to corporate acquisitions. This is a gap in the literature which our empirical work seeks to fill.

Additionally the existing studies use samples restricted to pure equity offers in order to control for the effect of the payment method on the choice of

Table 3.2
Summary of factors influencing the choice of accounting policy in corporate acquisitions.

Variable	Impact on the choice of accounting policy	Previous empirical evidence
Method of payment	To use merger accounting at least 90% of the total consideration paid must be in the form of equity.	Not previously examined.
Goodwill	If the takeover will lead to the recognition of a large goodwill figure then bidders will choose merger accounting. The elimination of goodwill under acquisition accounting implies a reduction in either net assets or future profits, while goodwill is not recognised under merger accounting.	US: Significant in Gagnon (1967), Copeland & Wojdak (1969), Anderson & Louderback (1975) and Nathan (1988). UK: Not significant in Higson (1990b).
Target's pre acquisition reserves	If the target has large pre acquisition reserves, then the bidder will prefer merger accounting. Under merger accounting, the bidder can use the target's pre acquisition reserves as a source of paying future dividends, while pre acquisition reserves are not distributable under acquisition accounting.	US: Not previously examined UK: Not significant in Higson (1990b)
Target's depreciable fixed assets	Under acquisition accounting, the target's depreciable fixed assets are revalued, with a consequent change in future depreciation charges. There is no revaluation under merger accounting. Upward revaluations increase future depreciation charges creating a preference for merger accounting. Downward revaluations create a preference for acquisition accounting.	US: Not previously examined UK: Not significant in Higson (1990b)

Table 3.2 (Continued).
Summary of factors influencing the choice of accounting policy in corporate acquisitions.

Variable	Impact on the choice of accounting policy	Previous empirical evidence
Profitability of the target relative to the bidder	Bidders acquiring highly profitable targets will prefer merger accounting. Under acquisition accounting, target's profits can only be consolidated from the date of acquisition, while under merger accounting pre acquisition profits arising in the current year can be consolidated into the current year's earnings.	US: Not previously examined UK: Significant in Higson (1990b)
Size of the bidder	Merger accounting will produce a higher profit figure with the result that the bidder's acquisition program could face increased scrutiny from the anti monopoly agencies. Hence large bidders will prefer to use acquisition accounting.	Not previously examined.
Size of the target	Bidders acquiring small targets can afford to choose an income increasing accounting policy (ie, merger accounting) since the acquisition of a small target is unlikely to attract anti-trust scrutiny of the bidder's acquisition program.	Not previously examined.
Bidder's gearing ratio	Bidders with high gearing will prefer merger accounting. Elimination of goodwill under acquisition accounting will reduce the bidder's net worth, resulting in possible violation of debt covenant restrictions.	Not previously examined.

accounting policy. This use of selective sampling has prevented an investigation of the interaction between the choice of accounting policy and the method of payment. Our use of a simultaneous equations approach, improves on this methodological deficiency in the extant literature as discussed in the next two chapters.

CHAPTER 4

INTERACTION BETWEEN ACCOUNTING POLICY AND THE METHOD OF PAYMENT: METHODOLOGY, DATA AND RELATED ISSUES.

4.1. Introduction

The literature review in Chapter 2 has shown that despite the wide cross sectional variations that exist in the types of consideration offered in mergers and acquisitions very little is known about how bidders choose the consideration offered or the factors which explain the cross sectional variations which are observed in the types of consideration offered by acquiring companies.

In particular there has been no investigation of the association between the method of payment and choice of accounting policy. In equilibrium the method of payment and the choice of accounting method may be jointly determined (see Section 2.3). This joint relationship requires the use of a simultaneous equations framework, if we wish to study the interaction between the choice of accounting policy and the method of payment.

In this chapter we outline such a simultaneous equations model and discuss some of the related empirical problems in estimating it.

To estimate the model and to avoid an omitted variables problem, we use a number of exogenous control variables. The chapter presents the definitions of these control variables. We also describe the criteria used in the selection of the sample and descriptive statistics on

the data.

4.2. Methodology

Earlier studies investigating the choice of accounting method which were reviewed in the last chapter, control for the effect of payment method by restricting their samples primarily to equity only offers (Gagnon, 1967; Copeland & Wojdak, 1969; Anderson & Lquderback, 1975; Robinson & Shane, 1990; Higson, 1990b). On the other hand, studies concerned with the determinants of the payment method (see Chapter 2) adopt a two group Logit discriminant methodology. The Logit model requires a binary dependent variable. Hence these studies restrict their sample to only those observations in which the method of payment is either "all cash" or "all equity" (see Hansen, 1987; Amihud et al, 1988; Higson, 1990a). A single equation approach is flawed, given the joint determination of the two choices (see Section 1.2.4 for a discussion of the limitations of the single equation approach).

Our simultaneous equations methodology obviates selective sampling as a means of controlling for the effect of either payment method or accounting method on the other. By using the Two Limit Tobit Model for the choice of payment method, we are able to overcome the restriction of the two group Logit methodology with a specification in which the offer of a mixture of cash and equity is naturally reflected in the model. Our sampling is, therefore, not limited to 100% cash or 100% equity cases.

Again, in modelling the determinants of the accounting method, our sample is not restricted to 100% equity offers.

4.2.1. Simultaneous equations model

The relationship between the method of payment and the choice of accounting method is examined within the context of the following simultaneous equations system

$$PM = f (ACCMET, \mathbf{X}) \quad (1a)$$

$$ACCMET = f (PM, \mathbf{Y}) \quad (1b)$$

where

PM is the method of payment

ACCMET is the method of accounting

\mathbf{X} and \mathbf{Y} represent vectors of exogenous control variables.

Under the statistical specification of this equation system, we define an unobserved variable PM_i^* which is an index of the propensity to use equity financing in any particular acquisition. The index PM_i^* may be interpreted as reflecting the perceived differential benefits to the bidder of equity and cash financing in the i th acquisition. When the benefits of equity financing are greater than those of cash financing the propensity to use equity financing will be greater than zero, ie, $PM_i^* > 0$.

The propensity to use a particular method of financing cannot be directly observed. The observed variable is PM_i which is the proportion of equity in the i th acquisition.

PM_i^* has an unrestricted range of values, while PM_i is bounded by zero and one. When the propensity to use equity is large and $PM_i^* \geq 1$ then $PM_i = 1$. When $0 < PM_i^* < 1$, $PM_i^* = PM_i$ the acquisition is financed by a mixture of cash and equity. When the propensity to use equity is small and $PM_i^* \leq 0$ then $PM_i = 0$. The various combinations are summarised below

If $PM_i^* \geq 1$ then $PM_i = 1$	"all equity offer"
If $0 < PM_i^* < 1$ then $PM_i = PM_i^*$	"Mix of equity & cash"
If $PM_i^* \leq 0$ then $PM_i = 0$	"all cash offer"

Similarly $ACCMET_i^*$ is an index of the perceived differential propensity for the bidder to use merger or acquisition accounting in the i th acquisition. The index is not directly observed, what we observe is a dummy variable $ACCMET_i$ which is defined by

$$ACCMET_i = \begin{cases} 1 & \text{if } ACCMET_i^* > 0, \text{ ie, Merger Accounting} \\ 0 & \text{otherwise, ie, Acquisition Accounting} \end{cases}$$

This equation system is estimated by a two stage procedure. First we estimate the reduced form for PM by the Two Limit Tobit method (See Maddala, 1983: p.160) and the reduced form for ACCMET by the Logit method (See Maddala, 1983: p.22). The structural equation for PM is then estimated by the second stage Two Limit Tobit (2STM) and the structural equation for ACCMET is estimated by second stage Logit (2SLM).

4.2.2. Econometric problems in estimating the simultaneous equations models

Because this is an equation system with a mixture of doubly censored (payment method) and dichotomous (accounting method) endogenous variables, we have not been able to derive an efficient asymptotic covariance matrix estimator for the model. This implies that the t-statistics which we report for the estimated model parameters may not be efficient (see Maddala, 1983: p.246).

As a partial, admittedly imperfect, solution to the problem of inefficient t-statistics, we attempt an alternative model formulation by recoding PM as a dichotomous rather than a doubly censored variable. If both endogenous variables are dichotomous we can use a two stage Logit method to estimate the system (see Maddala, 1983: p.246) with efficient t-statistics. Dichotomising the payment method variable PM is achieved by restricting the sample to only those observations in which the method of payment is either "all equity" or "all cash". The results from this two stage Logit method can then be compared with the results for the complete sample to check how sensitive our conclusions are to the problem of inefficient t-statistics.

We also examine whether a single equation model is statistically adequate and satisfactory despite the conceptual validity and methodological superiority of the simultaneous equations model. This procedure allows our results to be more easily compared to those of earlier

studies employing the single equation model. We estimate the functional relationship for PM and ACCMET as single equation models and use the Wu-Hausman test (Hausman, 1978) to check for the existence of any simultaneity bias which may necessitate the simultaneous equations model approach.

4.2.3. Test for simultaneity bias

In the simultaneous equation model we have two endogenous variables PM and ACCMET. For simplicity we represent the vector of exogenous variables in the first equation by X_1 and the vector of exogenous variables in the second model by X_2 . To test for simultaneity bias in the single regression model we first obtain the predicted values PM^* (by Two Limit Tobit method) and $ACCMET^*$ (by Logit method) from the reduced form equations for PM and ACCMET. We then estimate the models

$$PM = \alpha_1 + \beta_1 ACCMET + \Lambda_1 X_1 + \beta_1^* ACCMET^* + \mu_1$$

and

$$ACCMET = \alpha_2 + \beta_2 PM + \Lambda_2 X_2 + \beta_2^* PM^* + \mu_2$$

Λ_1 and Λ_2 represent vectors of the estimated coefficients for the exogenous variable vectors X_1 and X_2 respectively.

If the test $\beta_1^* = 0$ and $\beta_2^* = 0$ is rejected then the single equation regression results are subject to simultaneity bias. For a fuller description of this test, see Hausman (1978).

4.3. Control variables

The finance and accounting literature reviewed in Chapters 2 and 3 suggests several variables which may affect either the method of payment or the choice of accounting method. In order to avoid an omitted variables problem and to facilitate the identification of the simultaneous equations system we introduce these variables into our model as control variables. These variables and how they are defined in this study are discussed below.

4.3.1. Control variables for the method of payment

The following variables are used as control variables in the method of payment equation:-

Potential goodwill arising on the acquisition (GWILL)

The use of merger relief provisions in conjunction with acquisition accounting, implies that goodwill can have a direct impact on the method of payment independent of the use of merger accounting (see Section 3.3.2). When the bidder chooses not to use merger accounting, the method of payment could still be of concern if goodwill needs to be written off to the merger reserve account. The size of the merger reserve created in an acquisition is a direct function of the proportion of equity used in the method of payment.

Goodwill is proxied by¹

$$GWILL = \frac{\text{Value Of The Offer} - \text{Target's Net Assets}}{\text{Bidder's Net Assets}}$$

The net assets of both the bidder and the target are measured at the last balance sheet prior to acquisition announcement. We recognise that balance sheet values are not equivalent to fair values. However problems with data availability restricted our ability to use a more refined proxy. We initially attempted to collect the goodwill figure as disclosed by the bidder in the annual report but we encountered a number of difficulties in the process:-

1) Many bidders make multiple acquisitions in a year and only the figure for total goodwill is disclosed.

2) Many bidders disclosed goodwill figures in their accounts which were net of any available merger relief and could not be disentangled.

3) Prior to the issue of SSAP 22 (revised) in July 1989 there was no requirement for bidders to provide details of the fair value adjustments in their annual reports hence data on fair values prior to this period which covers almost the entire sample is very patchy.

4) Bidders using merger accounting do not have to

¹We have chosen to normalise the difference between the price paid for the target's assets and the book value of those assets by the bidder's net assets rather than the bidder's earnings (see Gagnon, 1967 in Section 3.4) because in the UK, very few companies amortise goodwill through the P&L account. Any adverse impact of goodwill write off is more likely to be felt in the balance sheet than in the P&L account.

disclose the goodwill that would have arisen if acquisition accounting had been used.

In cases where bidders revalue the targets' assets upward prior to consolidation then the use of book values will overstate goodwill (see Section 3.3.1). Conversely if bidders make provisions against the target's asset values then the use of book values will understate goodwill. As we have no prior reason to believe that bidders in our sample will systematically choose to either revalue assets upward or make provisions against asset values, there is no reason to believe that the use of book values as a proxy for fair values will introduce any systematic bias into our results. Additionally the practice of frequently revaluing fixed assets which is allowed and encouraged by the UK accounting rules ensures that the difference between book values and the fair values of assets may not be too large.

The value of the offer is equivalent to the market value of the target at the unconditional date. In the case of cash offers this should be equivalent to the offer price per share multiplied by the number of outstanding target shares. In equity offers changes in the bidder's share price affects the value of the offer. The market value of the target at the unconditional date is a reasonable approximation of the purchase price paid by the bidder.

Because the offer value is determined at the unconditional date we could be criticised for using an ex-post measure of goodwill. It could be argued that since the bidder has to decide the method of payment ex-ante,

goodwill should correspondingly be calculated ex-ante ie, the value of the offer should be determined at a date before the unconditional date. We would argue that the choice of method of payment and the accounting policy are never fixed at any time during the bid process. The bidder can always choose to revise the method of payment (and correspondingly the chosen accounting method) if this will prove to be advantageous. If the bidder's ex-ante calculation of goodwill turns out to be incorrect, then a rational bidder will, if necessary, revise the method of payment² and the accounting policy since it is the ex-post value of goodwill that will be used in the consolidated accounts.

Bidder and target gearing (BIDGEAR and TAGGEAR)

We expect the proportion of equity in the payment currency to increase with the bidder's gearing as the cost of financing a cash offer increases with the bidder's gearing (see Section 2.8).

We expect the proportion of equity in the method of payment to be negatively correlated with the target's gearing, since the bidder can free ride on the monitoring activities of external creditors (see Section 2.8).

Gearing for both the bidder and the target is measured

²In some cases, a cash offer may be mandated by rule 9 or 11 of the City Code (see Section 2.2.2). This will not necessarily constrain the bidder's choice since a cash alternative underwritten by the bidder's merchant bank (see Section 2.2.1) allows a bidder wishing to make an equity offer to comply with the mandatory requirements of rules 9 and 11.

as

$$GEAR = \frac{Total Liabilities}{Total Assets}$$

Relative size of the bidder to the target (RELSIZE)

Information asymmetry reflects unshared private information held by parties to a transaction. Such an asymmetry exposes the bidder to valuation risk, ie, ex-post it turns out to have overvalued the target (see Section 2.4.1). The cost to the bidder of such a valuation error increases in the target size relative to the bidder and the proportion of cash in consideration. With equity some of this cost is borne by the target shareholders themselves due to the contingent nature of equity valuation. Bidders seeking to minimise this cost would offer a higher proportion of consideration in equity with increasing relative target size (Hansen, 1987).

The relative size of the bidder to the target is measured by

$$RELSIZE = \frac{Bidder's Market Value}{Target's Market Value}$$

Market value is price per share 2 months before the acquisition times the number of outstanding shares.

Dilution of existing block shareholdings (BIDDIR and BIDLGE)

Amihud et al (1990) suggest that the method of payment is a function of the ownership structure of the bidder. Equity offers dilute the holdings of managers and large shareholders in the bidder (see Section 2.6). The shareholding structure of the bidder is proxied by

BIDDIR = Proportion of shares (beneficial and non-beneficial) held by the directors of the bidder.

BIDLGE = Proportion of bidder shares held by large investors. This is equivalent to the total of all shareholdings greater than 5% in the bidder (excluding shares held by the directors).

As large external blockholders will wish to avoid a dilution of their holding (see Section 2.6.3), we expect a negative relationship between BIDLGE and the proportion of equity in the method of payment.

We postulate a non-linear relationship between BIDDIR and the probability of an equity offer. This reflects the intuitive idea that at low levels of shareholdings directors do not control enough shares to be concerned about the dilution effects of an equity offer. At very high levels of shareholdings, the directors have such a solid control over the firm that concern about the dilution effects of an equity offer would be minimal.

We use a piecewise linear regression model to capture this non-linearity. The variable BIDDIR is modified as follows:

$$BIDDIR_{0 \text{ to } 0.1} = \begin{cases} BIDDIR & \text{if } BIDDIR < 0.1 \\ 0.1 & \text{if } BIDDIR \geq 0.1 \end{cases}$$

$$BIDDIR_{0.1 \text{ to } 0.25} = \begin{cases} 0 & \text{if } BIDDIR < 0.1 \\ BIDDIR \text{ minus } 0.1 & \text{if } 0.1 \leq BIDDIR < 0.25 \\ 0.15 & \text{if } BIDDIR \geq 0.25 \end{cases}$$

,

$$BIDDIR_{over \ 0.25} = \begin{cases} 0 & \text{if } BIDDIR < 0.25 \\ BIDDIR \text{ minus } 0.25 & \text{if } BIDDIR \geq 0.25 \end{cases}$$

The piecewise regression model is a technique for estimating non-linear patterns in a dataset (Morck, Shleifer & Vishny, 1988). It is a procedure which allows for multiple changes in the slope of the regression line describing the relationship between two variables.

At low levels of shareholding the directors do not control enough shares to be particularly concerned about dilution. Hence, we expect a positive relationship between $BIDDIR_{0 \text{ to } 0.1}$ and the probability of an equity offer. Beyond the 10% level, any new issue of shares will have an impact on directors' control. Any dilution of control between the 10% to 25% range could affect the ability of directors to defeat any challenge to their authority. Hence we expect a negative relationship between $BIDDIR_{0.1 \text{ to } 0.25}$ and the proportion of the acquisition which is equity financed. At high levels

of percentage holding the dilution effects of an equity offer are insignificant, hence we expect a positive relationship between $BIDDIR_{\text{over } 0.25}$ and the probability of an equity offer.

In the above piecewise definition we allow for two changes in the slope coefficient on BIDDIR (ie, at 10% and 25%). There is no theoretical justification for choosing these particular points. To make sure that our results are robust, we estimate the model allowing for slope changes at different points. The results are fairly insensitive to variations in the points at which the slope changes are allowed to occur³.

Conditions in the capital market (RETMKT and RETBID)

Bidders faced with favourable conditions in the stock market will be inclined to use equity as a method of payment (see Section 2.7).

We use two alternative proxies to capture the condition of the market:

RETMKT = Cumulative return on the market index during the 80 trading days beginning 120 days before the announcement of the bid⁴.

RETBID = Cumulative unadjusted return on the bidder's equity during the 80 trading days beginning 120 days before

³As a further robustness test to examine whether the relationship is non-linear with two slope changes, we estimated the model using BIDDIR in the linear, squared and cubic form (ie, BIDDIR, BIDDIR² and BIDDIR³) without any changes in the results.

⁴Returns are calculated as log returns. See Appendix 8.1. for the formulas.

the announcement of the bid.

The bidder's pre-bid returns have not been adjusted for market movements because what we are trying to measure is the general direction in which the bidder's shares are moving and not its movement relative to the market e.g, a bidder whose shares fall by 10% when the market falls by 15% will have an abnormal return of +5% (assuming beta = 1). A measure of pre-bid performance which is relative to the market may wrongly indicate that such a bidder was in a favourable market.

Cash resources (BIDCASH and TAGCASH)

Cash rich bidders are in a better position to make a cash offer than cash poor firms. Additionally the cash resources of the target can be used to help finance part of the cost of the acquisition⁵. We expect the liquidity of the bidder and the target to be negatively related to the proportion of equity in the method of payment (see Section 2.10). Cash liquidity for both the bidder and the target is measured by:

$$CASH = \frac{\text{Cash In Hand} + \text{Marketable Securities At Market Value}}{\text{Net Assets}}$$

⁵This is subject to the Companies Act 1985 regulation which prohibits a company from giving financial assistance for the acquisition of its own shares (see Section 2.10).

Growth opportunities (VRBID & VRTAG)

Since a high level of debt acts as a disincentive for managers to undertake positive NPV projects (growth options), firms with growth options should reduce their leverage (Myers, 1977). This suggests that an acquisition in which either the bidder or the target have a high proportion of their value represented by growth options is more likely to be financed with equity (see Section 2.9).

Knowledge of a firm's investment opportunity set is required to distinguish firms with high growth options from firms with low growth options. Unfortunately a firm's investment opportunity set is not observable, hence we need a suitable proxy. Firms with a high Tobin's q ratio are presumed to have growth opportunities and hence positive NPV projects, while low q bidders are not likely to have positive NPV projects. (Lang, Stulz & Walkling, 1991; Smith & Watts, 1993; Gaver & Gaver, 1993). Tobin's q is defined as:

$$\text{Tobin's } q = \frac{\text{Market Value of Total Assets}}{\text{Replacement Cost of Total Assets}}$$

Data is not available in the UK to calculate the replacement cost of assets in place, hence we approximate the Tobin's q ratio with the Valuation Ratio (VR) which is defined as:

$$\text{VR} = \frac{\text{Market Value of Equity} + \text{Book Value of Total Debt}}{\text{Book Value of Total Assets}}$$

VRBID and VRTAG represent the valuation ratios of the bidder and the target respectively. The valuation ratio was used as a measure of investment opportunities by Lewellen, Loderer & Martin (1987), Collins & Kothari (1989), Chung & Charoenwong (1991), Smith & Watts (1993), Gaver & Gaver (1993). Smith and Watts (1993) argue that firms with a high proportion of their total value made up of "assets in place" have low growth options and that the book value of assets was a suitable proxy for "assets in place". In a similar vein, Collins & Kothari (1989) argue that the difference between the market value and the book value of assets is a reasonable approximation of the investment opportunities facing the firm.

Free cash flow (FREECASH)

Jensen's (1986) free cash flow hypothesis predicts that bidders with free cash flow will invest in negative NPV projects rather than return excess cash flow to the shareholders. If free cash flow is the motivating factor behind an acquisition then we would expect the probability of an equity offer to be negatively correlated with the level of free cash flow.

Free cash flow exists when a firm lacks profitable investment opportunities. The valuation ratio (see VR above) serves as a proxy for the firm's investment opportunities. For bidders with a valuation ratio greater than one we don't expect any association between cash flow and the method of payment, while for bidders with a

valuation ratio less than 1, we expect a negative association between cash flow and the probability of an equity offer.

Free cash flow is measured as an interaction variable. If the bidder has a valuation ratio greater than 1 then free cash flow equals zero otherwise free cash flow equals the firm's cash flow⁶, ie:

$$\text{Free Cash Flow} = \begin{cases} 0 & \text{if } \text{VRBID} > 1 \\ \text{Cash flow} & \text{if } \text{VRBID} < 1 \end{cases}$$

As there are many cash flow measures which have been proposed in the accounting literature, we use several proxies to measure cash flow in order to investigate whether our results depend on the cash flow measure used. The definitions below are similar to those used in Bowen, Noreen & Lacy (1981). The first proxy for cash flow is

$$\text{NPDNA} = \frac{\text{Operating Profit} - \text{Minority Interest} - \text{Dividend} - \text{Taxes} + \text{Depreciation}}{\text{Net Assets}}$$

The second cash flow measure is

$$\text{WCONA} = \frac{\text{NPDNA} + \text{Minority Interest} - \text{Associate Profit} - \text{Increase In Long Term Provisions}}{\text{Net Assets}}$$

⁶This measure is superior to using just the cash flow measure as a proxy for free cash flow because, high cash flow in a firm does not necessarily equate to free cash flow if the firm has growth opportunities. Cash flow is only free when there are no growth opportunities. Lang, Stulz & Walkling (1991) used a similar approach in their definition of free cash flow.

The final cash flow measure is

$$CFONA = \frac{WCONA - \frac{\text{Increase In Stocks}}{\text{Net Assets}} - \frac{\text{Increase In Debtors}}{\text{Net Assets}} + \frac{\text{Increase In Current Liabilities}}{\text{Net Assets}}}{\text{Net Assets}}$$

Type of bid - hostile or friendly (HOSTILE)

Bidders use cash as method of overcoming bid resistance by the target (see Section 2.11). We expect that the use of equity will be negatively correlated with the hostility of the target's management. Hostility of the target's management to the bid is measured by the variable HOSTILE, which is defined as a dummy variable equal to 1 if the first offer from the bidder is rejected by the target's management and 0 otherwise⁷.

Capital gains tax (CGAIN)

In a cash offer, the bidder may be required to compensate target shareholder for the immediate crystallisation of their CGT liability (see Section 2.5). The higher the CGT liability of the target's shareholders the higher the premium demanded from the bidder. Assuming that the bidder wishes to minimise the bid premium paid we expect the proportion of equity in the method of payment

⁷There is no agreed definition of a hostile bid in the literature. Sudarsanam (1994a) argued that the initial rejection of a bid, followed quickly by an acceptance of an increased offer, does not leave much of a contest to talk about. He defined a hostile bid as one rejected by the target's managers who then undertake one or more of a range of defensive strategies.

will be positively related to the potential CGT liability of target shareholders.

CGT is levied on the difference between the selling price of a share and its original purchase price, subject to any available indexation allowance. Data on the original purchase price for most investors is unavailable, hence estimating the potential CGT payable by target shareholders is difficult. Some of the proxies which have been used in the literature to measure the CGT payable by target shareholders include: (i) the difference between the offer value and the target's lowest share price over a specified period (Niden, 1988; Hayn, 1989); (ii) the proportion of target shares held by tax exempt investors (Niden, 1988; Peterson & Peterson, 1991).

We use share price appreciation over a one year period as a proxy for the CGT payable. The variable is defined as:

$$CGAIN = \frac{\text{Pre-bid Mkt Value Of The Target} - \text{Lowest Mkt Value Of The Target}}{\text{Lowest Mkt Value Of The Target}}$$

The lowest market value of the target over the preceding one year period is used as the base cost for approximating the CGT purchase price of target shareholders. The pre-bid market value of the target is measured 41 days before the announcement of the bid. We have chosen to use the pre-bid market value of the target in calculating CGAIN rather than the offer value in order to avoid the problem of capturing any tax compensating

premium which may be present in cash offers in the CGAIN variable.

We also use the notion of tax clienteles as a proxy for target shareholders' CGT tax rates. We expect that the higher the proportion of tax paying shareholders, the higher is the average tax rate of the target's shareholders. The CGT profile of the target's shareholders is proxied by

,

TAGLGE = Proportion of target shares held by large investors. This is equivalent to the total of all shareholdings greater than 5% in the target (excluding shares held by the directors and the bidder).

The majority of institutional investors are exempt from capital gains tax (ie, pension funds, investment trusts, unit trusts, charitable trusts etc). If we assume that institutional investors are also likely to be the large investors in companies, we expect the average tax rate of the target's shareholders to be inversely related to TAGLGE. This proxy suffers from a number of problems:-

1) Not all shareholders with a percentage holding greater than 5% will be tax exempt institutions.

2) The vast majority of shareholders will have percentage holdings less than 5%. Consequently the tax profile of the major shareholders may not be representative of the tax profile of the whole body of shareholders.

Unfortunately in the UK only data on shareholders with a percentage holding greater than 5% was publicly available during the study period. Lack of data prevents us from

using proxies which are better defined⁸.

4.3.2. Control variables for the choice of accounting method

The control variables in the choice of accounting method equation are:-

Potential goodwill arising from the acquisition (GWILL)

Under acquisition accounting goodwill can either be written off against net assets or amortised through the profit and loss account while goodwill is not recognised under merger accounting (see Section 3.3.1). The impact of goodwill on the choice of accounting method is mainly concerned with the bidder's ability to write off goodwill in the consolidated accounts. The bidder's ability to write off any goodwill arising on the acquisition depends on the size of the goodwill relative to bidder's net worth. We expect a positive association between GWILL (see Section 4.3.1 for definition) and the use of merger accounting as the bidder tries to avoid the problem of recognising goodwill.

Target's distributable reserves (DISRES & PAYOUT)

Under acquisition accounting the pre-acquisition reserves of the target have to be capitalised whereas under merger accounting they can be distributed as dividends (see

⁸A more suitable proxy would be the proportion of shares held by tax exempt investors.

Section 3.3.3). Bidders with a high dividend payout may wish to access the target's pre-acquisition reserves and the larger these reserves are the greater is the bidder's preference for merger accounting. The target's pre-acquisition reserves are proxied by

$$DISRES = \frac{\text{Target's Accumulated Distributable Reserves}}{\text{Target's Net Assets}}$$

We expect DISRES to be positively related with the use of merger accounting.

The bidder's pre-acquisition dividend payout is proxied by

$$PAYOUT = \frac{\text{Bidder's Dividend}}{\text{Bidder's Net Income}}$$

We expect PAYOUT to be positively related with the use of merger accounting.

Target's depreciable fixed assets (DEPFA)

Acquisition accounting requires that the target's fixed assets be restated to their fair values prior to consolidation. Any revaluation of fixed assets would have an impact on future earnings as depreciation charges are passed through the P&L account (see Section 3.3.4). Where fixed assets are revalued upward the bidder would like to avoid the higher depreciation charges in the future. Where fixed assets are revalued downward the bidder would welcome

the lower future depreciation charges. The importance of the target's depreciable fixed assets is measured by

$$DEPFA = \frac{\text{Target's Depreciable Fixed Assets}}{\text{Target's Net Assets}}$$

Ideally the depreciable fixed assets should be split into Value Increasing Depreciable Fixed Assets (VIDFA) and Value Decreasing Depreciable Fixed Assets (VDDFA) as discussed in Section 3.3.4. Unfortunately the availability of data from Datastream to enable us to carry out this split is very patchy. For a significant number of observations in the sample Datastream does not provide any analysis on the composition of fixed assets. In order to avoid a significant reduction in the sample size due to missing data we have used DEPFA in our analysis. We do not attach any a priori sign to the impact of DEPFA on the probability of choosing merger accounting.

Relative profitability of the bidder to the target (PROFIT)

Under acquisition accounting only the post-acquisition profits of the target can be included in group profits whereas under merger accounting both pre and post acquisition profits can be included in group profits (see Section 3.3.5). Bidders with low profitability who acquire highly profitable targets will value the opportunity provided by merger accounting to boost the reported earnings in the year of acquisition. The profitability of the target relative to the bidder is measured by

$$PROFIT = \frac{\text{Target's Return On Equity}}{\text{Bidder's Return On Equity}}$$

We expect a positive association between PROFIT and the probability of using merger accounting.

Size of the merging firms (BIDSIZE & TAGSIZE)

Large firms reporting high profits following acquisitions may attract antitrust scrutiny and possibly invite antitrust sanctions (see Section 3.3.6). To avoid these political costs, acquisitions involving large firms are more likely to be accounted for using accounting policies which do not result in the reporting of high profits. The effect of size on the choice of accounting method is proxied by:-

BIDSIZE = Market value of the bidder's equity 41 trading days before the announcement of the bid.

TAGSIZE = Market value of the target's equity 41 trading days before the announcement of the bid.

We expect BIDSIZE and TAGSIZE to be negatively related to the use of merger accounting.

Bidder's gearing (BIDGEAR)

Since debt covenant constraints increase in severity with gearing, bidders with high gearing are likely to attempt to loosen these constraints by choosing income increasing accounting policies (see Section 3.3.7). We expect that bidders with high pre-acquisition gearing will

choose merger accounting. If this preference is reflected in the bidders' choice of equity, such a choice in itself may attenuate the severity of debt covenants.

4.4. The complete simultaneous equations model

The simultaneous equations system incorporating both endogenous and control variables is as follows:

$$\begin{aligned} \text{PM} = & f(\text{ACCMET}, \text{GWILL}, \text{RELSIZE}, \text{BIDGEAR}, \text{TAGGEAR}, \\ & \text{BIDDIR}, \text{BIDLGE}, \text{RETMKT}, \text{BIDCASH}, \text{TAGCASH}, \text{VR}, \\ & \text{FREECASH}, \text{HOSTILE}, \text{CGAIN}) \end{aligned} \quad (2A)$$

$$\begin{aligned} \text{ACCMET} = & f(\text{PM}, \text{GWILL}, \text{DISRES}, \text{PAYOUT}, \text{DEPFA}, \text{PROFIT}, \text{SIZE}, \\ & \text{BIDGEAR}) \end{aligned} \quad (2B)$$

In equation 2A, as stated earlier, we assume a nonlinear relationship between payment method and director's shareholding. BIDDIR has a piecewise specification as defined above.

The accounting variable (ACCMET) is dichotomous equal to 1 when merger accounting is used and 0 when acquisition accounting is employed.

The method of payment variable (PM) is a continuous variable representing the proportion of equity in the final offer and ranges from 0 to 1.

Definitions of the control variables and their data sources are summarised in Table 4.1. Both accounting and share price data were drawn from the Datastream

Table 4.1.

Definition of control variables used in the simultaneous equations model.

Variable	Definition
Method of Accounting Variables ¹ .	
GWILL	$(\text{Offer value} - \text{target's net assets}) / \text{bidder's net assets}$
DISRES	Target's pre acquisition accumulated distributable reserves / net assets.
PAYOUT	Bidder's pre-acquisition dividend / net income.
DEPFA	Target's depreciable fixed assets / net assets.
PROFIT	Target's return on equity / bidder's return on equity. Return on equity is profit for ordinary shares after tax / net assets.
BIDSIZE	Market value of bidder's equity at day -41 relative to bid announcement day 0.
TAGSIZE	Market value of target's equity at day -41 relative to bid announcement day 0.
BIDGEAR	Bidder's total liabilities / total assets.
Method of Payment Variables ²	
TAGGEAR	Target's total liabilities / total assets.
RELSIZE	Market value of the bidder's equity / market value of the target's equity. Market value is at day -41.
BIDDIR	Proportion (%) beneficial & non beneficial shares held by the directors of the bidder at acquisition announcement.
BIDLGE	Proportion (%) of all shareholdings greater than 5% in bidder (excluding directors' shares) at acquisition date.
RETMKT	Cumulative market return during days -120 to -41 before bid announcement day 0.
RETBID	Cumulative raw returns to bidder's equity over days -120 to -41.
VRBID	$(\text{Market value of the bidder's equity at day -41 plus book value of debt}) / \text{book value of total assets.}$

Table 4.1. (Continued)
Definition of control variables used in the simultaneous equations model.

Variable	Definition
VRTAG	(Market value of the target's equity at day -41 plus book value of debt) / book value of total assets.
NPDNA	Bidder's profit after tax, dividends and minority interest plus depreciation / net assets.
NPDFLOW	Dummy variable = NPDNA if the bidder's valuation ratio (VRBID) is less than 1, otherwise = 0.
WCONA	NPDNA plus minority interest share of profit plus increase in long term provisions minus associate company profit / net assets.
WCOFLOW	Dummy variable = WCONA if the bidder's valuation ratio (VRBID) is less than 1, otherwise = 0.
CFONA	WCONA plus increase in current liabilities minus increase in stocks minus increase in debtors / net assets.
CFOFLOW	Dummy variable = CFONA if the bidder's valuation ratio (VRBID) is less than 1, otherwise = 0.
BIDCASH	Bidder's cash plus marketable securities / net assets.
TAGCASH	Target's cash plus marketable securities / net assets.
HOSTILE	Dummy variable = 1 if the bidder's first offer is rejected by target management, otherwise = 0.
CGAIN	(Target's day -41 market value - target's lowest market value over the preceding one year) / the lowest market value.
TAGLGE	Proportion (%) of all shareholdings greater than 5% in target (excluding directors' and bidder's holding) at acquisition date.

Notes:

1) For GWILL, DISRES, PAYOUT, DEPFA, PROFIT & BIDGEAR accounting data are drawn from the last financial statement before the first bid announcement.

2) For TAGGEAR, VRBID, VRTAG, NPDNA, WCONA, CFONA, BIDCASH & TAGCASH accounting data are drawn from the last financial statement before the first bid announcement. For BIDDIR, BIDLGE & TAGLGE shareholding data at the announcement date are drawn from the Extel financial news summaries.

International database.

4.5. Sample selection

The sample contains all takeover bids which meet the following criteria :-

1) The bid was declared unconditional between 1st January 1980 and 31st December 1990. The sample period was chosen to reflect a full takeover cycle following the previous peak of 1976-78.

2) Both the bidder and the target had to be quoted on the London International Stock Exchange (LISE) at the time of the bid. Companies not quoted on the LISE generally do not have the option of offering equity as a method of payment.

3) The bid must have been successful and the bidder must have achieved control of the target. Unsuccessful bids were excluded from the sample because the accounting policy which would have been chosen by the bidder cannot be observed.

4) Datastream must have one year of pre-bid accounting data for both the bidder and the target.

5) Datastream must have at least 120 trading days of pre-bid daily share prices for both the bidder and the target. This ensure that we can calculate the pre-bid return on the bidder's equity (see definition of RETBID in Section 4.3.1).

The announcement date for each bid is defined as the earliest of the following three dates:-

i) First approach date: This is the date when the stock exchange is initially informed that merger talks are underway.

ii) First bid date: This is the date of the first formal offer. In the case of offers where there are multiple bidders, the event day for the target is the date of the formal bid from the first bidder. In cases where the subsequent bidder is successful, then the bidder and the target need not necessarily have the same event date.

iii) Unconditional date: In a mandatory bid⁹, this is the date when the bidder acquires more than 50% of the target's voting rights. In a voluntary bid the bidder may set a higher minimum acceptance level (eg, 90%) for the offer to become unconditional.

The final sample consists of 505 takeover bids. Various parts of this thesis require different amounts of data for the relevant analysis. These data requirements may reduce the sample size. Reductions in the sample size due to missing data are indicated at the appropriate places. 505 is the maximum sample size used in any part of this study.

4.5.1 Sample characteristics

Table 4.2 gives the distribution of the sample classified by both payment and accounting methods. As seen

⁹Under Rule 9 of the City Code on Takeovers and Mergers, where a bidder has acquired 30% of the target's voting shares or if already owning 30% or more, has increased its holding by 1% or more in the last 12 months, then a mandatory full offer must be made for the remaining shares. A voluntary offer is any bid other than a mandatory offer.

Table 4.2.
Sample distribution by payment method and accounting method.
Percentage of total given in parentheses.

Panel A: By Bidder's Offer of Payment Currency ¹ .									
All Cash	Cash or Debt	All Cash or (Equity Plus Cash)	All Equity or (Equity Plus Cash)	Equity and Cash	Equity with Cash alternative (Underwritten)	Equity with Cash alternative (Not Underwritten)	All Equity	Others	Total
24 (4.75)	59 (11.68)	40 (7.92)	13 (2.57)	42 (8.32)	137 (27.13)	86 (17.03)	88 (17.43)	16 (3.17)	505 (100.00)
Panel B: By Proportion of Equity in the Final Offer ² .									
PM _i = 0	0 < PM _i < 25	25 < PM _i < 50	50 < PM _i < 75	75 < PM _i < 100	PM _i = 100 (Underwritten)	PM _i = 100 (Not Underwritten)	Total		
89 (17.62)	28 (5.54)	49 (9.70)	61 (12.08)	77 (15.25)	115 (22.77)	86 (17.03)	505 (100.00)		
Panel C: By Accounting Method Selected by Bidder ² .									
Acquisition Accounting With Merger Relief	Acquisition Accounting With Goodwill Capitalised And Amortised	Acquisition Accounting With Goodwill Written Off to Reserves	Acquisition Accounting With a Capital Reserve	Acquisition Accounting With a Dangling Debit.	Merger Accounting	Total			
265 (53.55)	10 (2.03)	127 (25.76)	23 (4.67)	14 (2.84)	54 (10.95)	493 (100.00)			

Notes:

- 1) The method of payment offered by the bidder was obtained from the Extel financial news summaries.
- 2) The proportion of equity in the final offer and the accounting policy selected by the bidder were obtained from the first financial statement released by the bidder after the completion of the acquisition.

in Panel A, equity offer with a cash alternative is the most widely used method of payment. This method of payment constitutes 44% of the entire sample. The cash alternative can either be provided out of the bidder's own resources or through an underwriter. Such a large proportion of offers with a cash alternative attached to equity offers may be due to the requirements of rules 9 and 11 of the City Code (see Section 2.2.2).

Alternatively, the popularity of equity offers with a cash alternative could be due to its tax efficiency. Target shareholders who wish to avoid the crystallisation of CGT can choose the equity offer, while shareholders who do not want the bidder's equity in their portfolio can choose the cash offer. The underwriter provides a source of cash for an illiquid bidder. The underwriter can also act as a mechanism for signalling the true value of the bidder's assets to the market as in an underwritten rights issue (Slovin et al, 1990). Any shares left with the underwriters after the bid is either offered to the existing shareholders of the bidder in a claw back offer (vendor rights) or placed in the open market (vendor placing).

The data in Panel A is classified by the method of payment offered to the target shareholders. It does not, however, tell us what proportion of the final consideration is cash or equity. Panel B of Table 4.2 classifies the sample by the proportion of equity in the final consideration. This classification demonstrates that in the UK it is possible to divorce the consideration offered by

the bidder from that received by the target shareholders. In offers where $PM_i = 100\%$ (all equity with underwriting) the bidder would record a 100% equity offer in its accounts, but target shareholders accepting the cash alternative would have received cash not equity.

Analysis of the sample not reported in Table 4.2 shows that the 1987 stock market crash had a dramatic impact on equity offers¹⁰. As a proportion of the annual bids total, all equity offers ($PM_i = 100\%$) dropped from 58.24% in 1987 to 30.55% in 1988, while all cash offers ($PM_i = 0\%$) rose from 6.59% in 1987 to 23.61% in 1988. The market crash also diminished investment banks' enthusiasm for underwriting the cash alternative to equity offers. As a proportion of total annual bids, equity offers with an underwritten cash alternative rose from 7.69% in 1981 to 43.88% in 1986 coinciding with the bull market rise of the 1980's. While the stock market crash of October 1987 did not significantly reduce takeover activity it had a devastating impact on cash underwritten equity offers. Their proportion of the annual total dropped to 9.72% in 1988 and remained close to this level in 1989 and 1990.

Panel C of Table 4.2 gives the distribution of the sample by accounting method used by the bidder. We find that only 10.95% of UK bidders chose to use merger accounting. This is similar to the figure of 9.11% found in Higson (1990b). It is interesting to observe from Panel B that while at least 201 firms ($PM_i = 100$) satisfy the SSAP

¹⁰See the more detailed tables in Appendix 4.

23 condition for using merger accounting (i.e, at least 90% of the total consideration must be equity) only 54 firms actually used merger accounting. This suggests that bidders probably don't attach a great deal of value to the ability to use merger accounting.

The possibility of combining acquisition accounting with merger relief may partly explain why only a small number of bidders choose merger accounting. Panel C shows that more than 50% of bidders choose to combine acquisition accounting with merger relief. In fact Appendix 4.3 shows that bidders adopted the use of merger relief quicker than they did merger accounting after the 1981 Companies Act legalised merger accounting and introduced merger relief. Four bids with announcement dates in 1980 but whose consolidated accounts were published in 1981 took immediate advantage of the merger relief provisions of the 1981 Companies Act. The first use of merger accounting by any bidder in our sample did not occur until 1983 by which time the use of merger relief was already quite popular.

Acquisition accounting with a dangling debit refers to the practice of creating a new reserve with a zero balance and writing off goodwill to this reserve thus creating a debit balance. The net effect of the two methods - goodwill written off to reserves or as a dangling debit - is the same, viz. reduction in shareholders' funds. These methods only differ in balance sheet presentation.

Acquisition accounting with a capital reserve refers to negative goodwill which is credited to a special reserve

account on the balance sheet.

4.5.2. Descriptive statistics

Table 4.3 reports the mean, median and standard deviation on the control variables. The high standard deviations of GWILL, BIDSIZE, TAGSIZE, RELSIZE and VRBID indicate that the distributions of these variables are highly skewed. To minimise the impact of extreme outliers in these variables, except GWILL, we use the natural logarithms of these variables in our regression analyses. Since GWILL includes negative values we are unable to apply a similar transformation.

Table 4.4. reports the correlation matrix among the variables¹¹. There isn't a serious problem of multicollinearity in the models¹². Out of a total of 190 pairwise correlations among 20 control variables only 7 exceeded 0.30 and only 15 equalled or exceeded 0.20. The largest correlations were: 0.59 between the bidder's size (BIDSIZE) and relative size (RELSIZE), 0.55 between the pre bid return on the market index (RETMKT) and pre bid return on the bidder's shares (RETBID), -0.46 between the target's

¹¹Due to constraint of space, only one of the proxies for growth opportunities (VRBID), free cash flow (NPDFLOW) and size (BIDSIZE) are included in Table 4.4. Growth opportunities in the target (LOG of VRTAG) had a correlation coefficient of 0.54 with growth opportunities in the bidder (LOG of VRBID) but was not correlated with any other variables. Target size (LOG of TAGSIZE) had a correlation coefficient of 0.56 with bidder size (LOG of BIDSIZE) but had low correlations with other variables. Apart from a high correlation with NPDFLOW (which results from the definition of these variables) the other two proxies for free cash flow (WCOFLOW and CFOFLOW) had very low correlation coefficients with the other control variables.

¹²None of the variables with high correlation co-efficient occur simultaneously in the same equations.

Table 4.3.

Descriptive statistics for the control variables used in the simultaneous equations model.

The variables are defined in Table 4.1. The number of observations is different for each variable because complete data was not available for all variables.

VARIABLE	MEAN	MEDIAN	STD DEV	No OF OBS
GWILL	0.93	0.22	3.42	505
DISRES	0.30	0.35	0.69	505
PAYOUT	0.41	0.38	0.35	504
DEPFA	0.86	0.72	0.71	505
PROFIT	1.18	0.77	2.76	499
BIDSIZE (£M)	424.43	90.91	1197.21	504
LOG OF BIDSIZE	4.63	4.51	1.74	504
TAGSIZE (£M)	65.79	13.75	191.50	505
LOG OF TAGSIZE	2.91	2.62	1.49	505
BIDGEAR	0.28	0.26	0.15	505
TAGGEAR	0.28	0.27	0.15	505
RELSIZE	29.67	4.97	164.80	504
LOG OF RELSIZE	1.73	1.60	1.53	504
BIDDIR	0.12	0.03	0.17	505
BIDLGE	0.12	0.06	0.16	505
RETMKT	0.06	0.07	0.10	505
RETBID	0.09	0.08	0.22	505
VRBID	1.76	1.14	7.36	504
LOG OF VRBID	0.16	0.14	0.84	504

Table 4.3. (Continued)

Descriptive statistics for the control variables used in the simultaneous equations model.

The variables are defined in Table 4.1. The number of observations is different for each variable because complete data was not available for all variables.

VARIABLE	MEAN	MEDIAN	STD DEV	No OF OBS
VRTAG	1.36	1.01	2.65	505
LOG OF VRTAG	0.06	0.02	0.60	505
NPDNA	0.14	0.14	0.24	505
NPDFLOW	0.05	0	0.09	504
WCONA	0.15	0.15	0.28	476
WCOFLOW	0.05	0	0.09	503
CFONA	0.15	0.15	0.48	476
CFOFLOW	0.06	0	0.27	503
BIDCASH	0.26	0.16	0.34	503
TAGCASH	0.18	0.07	0.32	503
HOSTILE	0.23	0	0.42	505
CGAIN	0.55	0.33	1.27	505
TAGLGE	0.17	0.12	0.17	502

distributable reserves (DISRES) and the target's depreciable fixed assets (DEPFA) and 0.40 between the bidder's size (BIDSIZE) and directors' shareholding in the bidder (BIDDIR).

The negative relationship between firm size and directors' shareholding is consistent with evidence from Demsetz & Lehn (1985), Mikkelsen & Partch (1989) and Song & Walkling (1993). Demsetz & Lehn (1985) argue that *ceteris paribus* larger firms have larger capital requirements. Hence any attempt to preserve a high level of ownership concentration by a small group of investors implies a

Table 4.4.

Pearson correlation coefficients among the explanatory/control variables. The variables are defined in Table 4.1. Highlight indicates a value greater than or equal to 0.2.

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20
V1	0.03	-0.11	-0.01	-0.04	-0.13	0.02	0.00	-0.28	0.14	0.09	0.06	0.23	-0.10	0.04	0.06	-0.02	0.01	0.03	0.29
V2		0.01	-0.46	-0.11	0.13	0.01	-0.01	0.04	-0.01	-0.13	-0.02	0.01	-0.00	0.02	0.03	0.02	-0.00	-0.00	0.04
V3			-0.03	-0.07	0.02	-0.07	-0.03	0.06	-0.09	-0.07	-0.04	-0.11	0.06	-0.10	0.04	-0.04	-0.01	0.02	-0.17
V4				0.23	0.05	-0.08	-0.05	0.06	0.02	0.07	-0.05	-0.11	0.01	-0.07	-0.05	0.02	0.02	-0.01	-0.08
V5					-0.11	-0.04	0.11	-0.08	0.09	-0.07	0.02	-0.03	0.02	-0.04	0.10	-0.06	-0.02	-0.05	-0.11
V6						-0.17	0.02	0.59	-0.40	-0.34	-0.03	-0.08	-0.02	0.04	0.05	0.14	0.05	-0.07	0.02
V7							0.31	-0.04	0.09	0.00	0.04	0.04	-0.07	0.32	0.00	-0.09	-0.07	-0.05	0.19
V8								0.06	-0.03	0.03	0.02	0.02	0.01	0.16	0.20	-0.08	-0.08	-0.08	0.01
V9									-0.26	-0.26	-0.03	-0.08	-0.01	-0.01	-0.07	-0.11	-0.05	-0.00	-0.01
V10										-0.05	0.04	0.11	-0.12	0.11	-0.00	-0.10	-0.03	-0.01	0.14
V11											-0.02	0.05	-0.02	-0.02	0.03	-0.03	0.00	0.04	0.04
V12												0.55	-0.06	-0.00	-0.00	-0.02	0.06	-0.05	0.03
V13													-0.13	0.04	-0.01	-0.03	0.03	-0.09	0.21
V14															0.01	0.00	-0.03	0.05	-0.34
V15															0.13	0.01	-0.02	-0.06	0.08
V16																-0.08	-0.04	-0.03	-0.00
V17																	0.06	-0.08	-0.01
V18																		0.02	0.04
V19																			-0.02
V20																			

V1 = GWILL V2 = DISRES V3 = PAYOUT V4 = DEPFA V5 = PROFIT V6 = LOG (BIDSIZE) V7 = BIDGEAR

V8 = TAGGEAR V9 = LOG (RELSIZE) V10 = BIDDIR V11 = BIDLGE V12 = RETMKT V13 = RETBID V14 = NPDFLOW

V15 = BIDCASH V16 = TAGCASH V17 = HOSTILE V18 = CGAIN V19 = TAGLGE V20 = LOG (VRBID)

commitment of a larger proportion of their wealth to a single enterprise. Normal risk aversion results in a negative relationship between size and the concentration of shares held by any small group of investors (e.g, managers).

4.6. Conclusion

In this chapter we develop a conceptual framework in which a bidder's choice of payment method and its choice of accounting policy to account, post-acquisition, for the business combination are jointly determined. We formulate a simultaneous equations model to reflect this joint determination (see Section 4.2.1). A number of exogenous factors affecting the choice of either payment currency or accounting policy are included in our model as control variables.

We also describe the criteria used in the selection of the firms in our sample and we examine the sample characteristics in order to get a feel for the data. The Pearson correlation coefficients among the control variables show that most of the variables have very low correlations. This suggests that multicollinearity will not be a problem in the simultaneous equations model presented in the next chapter.

Appendix 4.1.
Distribution of the sample by announcement year and method of payment.
Percentage of annual total given in parentheses.

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11
Year	All Cash	Cash or Debt	All Cash or (Equity Plus Cash)	All Equity or (Equity Plus Cash)	Equity and Cash	Equity with Cash alternative (Underwritten)	Equity with Cash alternative (Not Underwritten)	All Equity	Others	Total
1980	1 (9.10)	0 (0.00)	0 (0.00)	1 (9.10)	1 (9.10)	1 (9.10)	2 (18.18)	4 (36.36)	1 (9.10)	11 (100.00)
1981	2 (15.38)	3 (23.08)	1 (7.69)	0 (0.00)	3 (23.08)	1 (7.69)	2 (15.38)	1 (7.69)	0 (0.00)	13 (100.00)
1982	1 (10.00)	4 (40.00)	0 (0.00)	0 (0.00)	1 (10.00)	1 (10.00)	3 (30.00)	0 (0.00)	0 (0.00)	10 (100.00)
1983	3 (12.50)	1 (4.17)	1 (4.17)	1 (4.17)	5 (20.83)	7 (29.17)	1 (4.17)	4 (16.67)	1 (4.17)	24 (100.00)
1984	2 (4.65)	8 (18.60)	2 (4.65)	0 (0.00)	6 (13.95)	15 (34.88)	4 (9.30)	4 (9.30)	2 (4.65)	43 (100.00)
1985	4 (6.25)	4 (6.25)	8 (12.50)	0 (0.00)	7 (10.94)	17 (26.56)	9 (14.06)	11 (17.19)	4 (6.25)	64 (100.00)
1986	3 (3.06)	8 (8.16)	8 (8.16)	0 (0.00)	3 (3.06)	43 (43.88)	17 (17.35)	14 (14.29)	2 (2.04)	98 (100.00)
1987	2 (2.20)	4 (4.40)	2 (2.20)	1 (1.10)	3 (3.30)	38 (41.76)	19 (20.88)	21 (23.08)	1 (1.10)	91 (100.00)
1988	3 (4.17)	14 (19.44)	8 (11.11)	3 (4.17)	9 (12.50)	7 (9.72)	10 (13.89)	16 (22.22)	2 (2.78)	72 (100.00)
1989	1 (1.85)	11 (20.37)	6 (11.11)	5 (9.26)	4 (7.41)	5 (9.26)	11 (20.37)	8 (14.81)	3 (5.55)	54 (100.00)
1990	2 (8.00)	2 (8.00)	4 (16.00)	2 (8.00)	0 (0.00)	2 (8.00)	8 (32.00)	5 (20.00)	0 (0.00)	25 (100.00)
Total	24 (4.75)	59 (11.68)	40 (7.92)	13 (2.57)	42 (8.32)	137 (27.13)	86 (17.03)	88 (17.43)	16 (3.17)	505 (100.00)

Appendix 4.2.

Distribution of the sample by the proportion of equity in the i th acquisition PM_i .
Percentage of annual total is given in parentheses.

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
Year	$PM_i = 0$	$0 < PM_i < 25$	$25 < PM_i < 50$	$50 < PM_i < 75$	$75 < PM_i < 100$	$PM_i = 100$ (Underwritten)	$PM_i = 100$ (Not Underwritten)	Total
1980	1 (9.09)	0 (0.00)	2 (18.18)	2 (18.18)	3 (27.27)	1 (9.09)	2 (18.18)	11 (100.00)
1981	5 (38.46)	2 (15.38)	1 (7.69)	2 (15.38)	2 (15.38)	0 (0.00)	1 (7.69)	13 (100.00)
1982	5 (50.00)	1 (10.00)	0 (0.00)	0 (0.00)	2 (20.00)	2 (20.00)	0 (0.00)	10 (100.00)
1983	4 (16.67)	0 (0.00)	4 (16.67)	4 (16.67)	1 (4.17)	7 (28.17)	4 (16.67)	24 (100.00)
1984	11 (25.58)	2 (4.65)	9 (20.93)	3 (6.98)	4 (9.30)	10 (23.26)	4 (9.30)	43 (100.00)
1985	9 (14.06)	2 (3.13)	7 (10.94)	12 (18.75)	11 (17.19)	12 (18.75)	11 (17.19)	64 (100.00)
1986	13 (13.27)	1 (1.02)	8 (8.16)	11 (11.22)	12 (12.24)	39 (39.80)	14 (14.29)	98 (100.00)
1987	6 (6.59)	1 (1.10)	4 (4.40)	11 (12.09)	16 (17.58)	32 (35.16)	21 (23.08)	91 (100.00)
1988	17 (23.61)	8 (11.11)	6 (8.33)	8 (11.11)	11 (15.28)	6 (8.33)	16 (22.22)	72 (100.00)
1989	14 (25.93)	5 (9.26)	5 (9.26)	5 (9.26)	11 (20.37)	6 (11.11)	8 (14.81)	54 (100.00)
1990	4 (16.00)	6 (24.00)	3 (12.00)	3 (12.00)	4 (16.00)	0 (0.00)	5 (20.00)	25 (100.00)
Total	89 (17.62)	28 (5.54)	49 (9.70)	61 (12.08)	77 (15.25)	115 (22.77)	86 (17.03)	505 (100.00)

Appendix 4.3.

Distribution of the sample by year and accounting method.
Percentage of annual total is given in parentheses.

Year	Acquisition Accounting With Merger Relief	Acquisition Accounting With Goodwill Capitalised	Acquisition Accounting With Goodwill W/O to Reserves	Acquisition Accounting With a Capital Reserve	Acquisition Accounting With a Dangling Debit.	Merger Accounting	Total
1980	4 (36.36)	0 (0.00)	4 (36.36)	3 (27.27)	0 (0.00)	0 (0.00)	11 (100.00)
1981	1 (7.69)	1 (7.69)	8 (61.54)	3 (23.08)	0 (0.00)	0 (0.00)	13 (100.00)
1982	2 (22.22)	0 (0.00)	5 (55.56)	2 (22.22)	0 (0.00)	0 (0.00)	9 (100.00)
1983	5 (20.83)	1 (4.17)	8 (33.33)	5 (20.83)	0 (0.00)	5 (20.83)	24 (100.00)
1984	13 (30.23)	3 (6.98)	17 (39.53)	4 (9.30)	1 (2.33)	5 (11.63)	43 (100.00)
1985	34 (53.13)	1 (1.56)	19 (29.69)	2 (3.13)	0 (0.00)	8 (12.50)	64 (100.00)
1986	62 (65.96)	0 (0.00)	16 (17.02)	1 (1.06)	2 (2.13)	13 (13.83)	94 (100.00)
1987	64 (73.56)	0 (0.00)	8 (9.20)	1 (1.15)	1 (1.15)	13 (14.94)	87 (100.00)
1988	32 (45.71)	3 (4.29)	24 (34.29)	0 (0.00)	5 (7.14)	6 (8.57)	70 (100.00)
1989	29 (53.70)	1 (1.85)	13 (24.07)	2 (3.70)	5 (9.26)	4 (7.41)	54 (100.00)
1990	18 (75.00)	0 (0.00)	5 (20.83)	0 (0.00)	0 (0.00)	0 (0.00)	24 (100.00)
Total	264 (53.55)	10 (2.03)	127 (25.76)	23 (4.67)	14 (2.84)	54 (10.95)	493 (100.00)

CHAPTER 5

INTERACTION BETWEEN ACCOUNTING POLICY AND THE METHOD OF PAYMENT: RESULTS OF EMPIRICAL ANALYSIS.

5.1. Introduction

The purpose of this chapter is to examine the relationship between the method of payment and the accounting policy choice decision of the bidder within the context of a simultaneous equations model which recognises the mutual dependence between the method of payment and the choice of accounting method. In the chapter we use the Two Limit Tobit model which overcomes some of the methodological limitations of previous studies (see Sections 1.2.4 and 4.2).

Some of the exogenous/control variables used in the simultaneous equations model are new, and allow us to investigate issues which hitherto have remained unexplored in the literature. In our model of the determinants of the choice of accounting policy, we test the debt covenant restriction hypothesis (see Section 3.3.7) and the political cost of earnings hypothesis (see Section 3.3.6) which have not been previously tested in the context of accounting policy choice in corporate acquisitions.

Some of the new issues examined in our study of the determinants of the payment currency in corporate acquisitions include the relationship between the method of financing new investments and:

- (i) the dilution of shares held by managers and

external blockholders;

(ii) the growth opportunities in the firm;

(iii) managerial use of free cash flow.

The major contribution of this chapter is to recognise explicitly and model the mutual dependency between accounting policy choice and payment method. We believe that this approach provides an insight into the more general issue of the interaction between financing decisions and accounting policy choice.

5.2. Univariate test

As a preliminary step in our analysis and to get a feel for the data, we carry out univariate tests¹ in which we compare the statistical significance of the difference in group means for the following subsamples:

1) All equity offers (equity group ie, $PM_i = 100\%$) with all cash offers (cash group ie, $PM_i = 0\%$).

2) Bids where the bidder has used merger accounting (merger group ie, $ACCMET = 1$) with bids where the bidder has used acquisition accounting (acquisition group ie, $ACCMET = 0$) .

3) Bids where the bidder has used merger accounting (merger group) with bids where the bidder was qualified to

¹We apply in addition to parametric tests, non-parametric testing procedures which make no assumptions about the underlying distribution of the data. Where the non-parametric and the parametric tests give the same results, then we are reassured that our conclusions are insensitive to deviations from non-normality in the data.

use merger accounting² but instead used acquisition accounting (qualified acquisition accounting group).

5.2.1. Cash offers and equity offers

Table 5.1 reports the results of difference-in-means tests comparing the "equity group" with the "cash group". Since the parametric t-test for the difference in group means can be performed based on the assumption of either equality of variance or inequality of variance between the two groups³, we report both sets of results. The non-parametric test of the difference in group medians [Mann-Whitney-Wilcoxon test⁴ (MWW)] is also reported, in order to check whether any deviations from non-normality in the data will significantly influence our conclusions.

Goodwill as a proportion of the bidder's net assets (GWILL) is 10.91% in the "cash group" and 146.69% in the "equity group". The average size of potential goodwill in equity offers (146.69%) is very large and different from the overall sample average of 93% (see Table 4.3). This suggests the presence of some outliers in the equity group. However, since the non-parametric MWW test is significant at better than the 1% level, this result is robust to non-normality in the data.

The larger size of GWILL in the equity group suggests

²Bids where the bidder fulfilled all the conditions for using merger accounting stipulated in SSAP 23 (see Section 3.2.1).

³See Wonnacott and Wonnacott (1977: Chapter 8).

⁴See Wonnacott and Wonnacott (1977: Chapter 16).

Table 5.1.

Difference in means between the "equity group" and the "cash group": Univariate tests.

The "equity group" represents bids where $PM_i = 100\%$ and the "cash group" represents bids where $PM_i = 0\%$. PM_i is the proportion of equity in the final method of payment. The "equity group" has 184 observations and the "cash group" has 89 observations. The means for the "cash group" and "equity group", the t-Statistics testing the difference in group means assuming both unequal and equal group variances and the non-parametric Mann-Whitney-Wilcoxon test statistic are reported. The variables are defined in Table 4.1.

Variable	Mean For Cash Group	Mean For Equity Group	t-Stat Assuming Unequal Variance	t-Stat Assuming Equal Variance	Mann- Whitney- Wilcoxon Test.
GWILL	0.11	1.47	4.25***	3.05***	7.01***
BIDGEAR	0.27	0.31	1.73**	1.82**	2.72***
TAGGEAR	0.30	0.28	0.50	0.52	0.23
RELSIZE	94.88	10.67	2.15**	3.08***	6.16***
LOG OF RELSIZE	2.70	1.37	6.17***	7.05***	6.16***
BIDDIR	0.11	0.14	1.18	1.26	4.05***
BIDLGE	0.12	0.11	0.37	0.40	0.58
RETMKT	0.04	0.08	2.92***	3.07***	3.18***
RETBID	0.05	0.13	3.02***	2.63***	2.60***
VRBID	1.12	2.58	1.63*	1.14	5.22***
LOG OF VRBID	-0.06	0.29	3.28***	2.61***	5.22***
VRTAG	1.16	1.29	1.12	1.23	2.73***
LOG OF VRTAG	-0.05	0.11	2.17**	2.26**	2.73***
NPDNA	0.14	0.13	0.33	0.24	0.84
WCONA	0.15	0.12	0.70	0.52	0.25
CFONA	0.25	0.05	2.99***	2.68***	2.48***

Note:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively, one tail test.

Table 5.1 (Continued).

Difference in means between the "equity group" and the "cash group": Univariate tests.

The "equity group" represents bids where $PM_i = 100\%$ and the "cash group" represents bids where $PM_i = 0\%$. PM_i is the proportion of equity in the final method of payment. The "equity group" has 184 observations and the "cash group" has 89 observations. The means for the "cash group" and "equity group", the t-Statistics testing the difference in group means assuming both unequal and equal group variances and the non-parametric Mann-Whitney-Wilcoxon test statistic are reported. The variables are defined in Table 4.1.

Variable	Mean For Cash Group	Mean For Equity Group	t-Stat Assuming Unequal Variance	t-Stat Assuming Equal Variance	Mann-Whitney-Wilcoxon Test.
NPDFLOW	0.05	0.03	2.42***	2.53***	3.15***
WCOFLOW	0.06	0.04	1.79**	1.86**	2.14**
CFOFLOW	0.13	0.03	2.31**	3.17***	2.46***
BIDCASH	0.35	0.21	2.67***	3.04***	4.07***
TAGCASH	0.19	0.20	0.13	0.13	1.11
HOSTILE	0.20	0.21	0.08	0.08	0.08
CGAIN	0.41	0.51	1.43*	1.46*	1.63*
TAGLGE	0.16	0.16	0.24	0.25	0.92

Note:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively, one tail test.

that bidders who face a substantial goodwill write off are more likely to use equity offers as a method of avoiding the negative impact of writing off goodwill. Equity offers can ameliorate the adverse consequences of goodwill in the consolidated accounts through the use of either merger accounting or the merger reserve. This choice is discussed further below (see Tables 5.2 and 5.4).

Bidders using equity have an average gearing (BIDGEAR) of 30.56% compared to 27.17% for bidders using cash. This

is consistent with our prior hypothesis that highly geared bidders are more likely to use equity because the costs of raising the necessary funds to finance a cash offer are positively related to the firm's level of gearing.

In cash offers bidders are 94.88 times larger than the target (RELSIZE) but only 10.67 times larger in equity offers. This is consistent with the information asymmetry hypothesis that large targets are acquired with equity in order to reduce the valuation risk faced by the bidder (Hansen, 1987). The statistically significant difference in relative size between cash and equity offers is still maintained when we use the LOG OF RELSIZE and the MWW non-parametric test. This indicates that this result is robust and is not being driven by outlier values.

Over a period of 81 trading days (4 calendar months) ending 41 days before the announcement of the bid, bidders using equity experienced an average rise in their share price of 13% (RETBITD) compared to 5% for bidders using cash. This difference is significant at the 1% level. Over a similar period, the average rise in the stock market when bidders used equity was 8% compared to an average rise of 4% when bidders used cash. This supports the hypothesis that equity is more likely to be used in a favourable market.

Growth opportunities in the bidder (VRBITD) and the target (VRTAG) are higher in bids financed with equity than for bids financed with cash. This is consistent with Myers' (1977) model that firms with growth options should finance

new investments with equity (see Section 2.9). The presence of outliers in the distributions for VRBID and VRTAG (see Section 4.5.2) may explain why better results are obtained with the natural logarithms of these variables and the non-parametric MWW tests.

Bidders using cash have higher cash flows (NPDNA, WCONA and CFONA) than bidders using equity, irrespective of the cash flow definition used. However only the CFONA variable is statistically significant. The impact of cash flow on the method of payment is based on the concept of free cash flow. To investigate the free cash flow idea we use variables which combine our cash flow measures with the firm's growth opportunities proxied by the valuation ratio (NPDFLOW, WCOFLOW and CFOFLOW). With all three cash flow measures we find that cash paying bidders have significantly higher free cash flow than bidders using equity. This suggests that among bidders with no growth opportunities, those with a higher level of cash flow tend to use it to make cash acquisitions. This observation is consistent with Jensen (1986).

Not surprisingly we find that bidders using cash are more liquid than bidders using equity (BIDCASH). It is difficult to decide how much importance should be attached to this result, since we may simply be observing the effects of anticipatory financing by bidders planning to use cash. However when we consider that bidders using cash have both higher liquid resources and higher cash flow than bidders using equity, anticipatory bid financing may not be

the factor driving this result⁵. We do not find any evidence that the cash resources of the target have an impact on the method of payment, suggesting that bidders do not use the liquid resources of the target to help finance the bid. This is probably due to the 1985 Companies Act provisions which prohibit the target from providing assistance for the acquisition of its own shares (see Section 2.10).

There is no significant difference in hostility between cash offers and equity offers. 23% of the entire sample was made up of hostile bids (See Table 4.3). The percentages for cash and equity offers were 20% and 21% respectively⁶. This result is inconsistent with Sudarsanam (1994b) who found that cash offers increased the probability of success for the bidder in hostile bids. The evidence here does not support the hypothesis that cash has a pre-emptive role to play in a hostile takeover⁷.

Short run capital gains (CGAIN) are higher in equity than in cash offers. This is consistent with the capital gains tax compensation hypothesis. However in the

⁵A preliminary analysis of rights issues in the six months preceding our sample bids, showed that only a small number of bidders (about 40) made such rights issues.

⁶The proportion of hostile bids for the overall sample is greater than the proportion for cash and equity offers because 26% of mixed offers were hostile bids.

⁷Differences in the sample selection criterion may explain this inconsistency. Our sample is made up entirely of completed bids which may be hostile or friendly. Sudarsanam (1994b) uses a sample of only hostile bids, which includes both failed and completed bids. Sudarsanam's results may be indicating that once a bid turns hostile, then cash is more advantageous to the bidder without suggesting that cash should be more prevalent in hostile bids.

multivariate regressions reported below, the effect of CGAIN on the choice of payment method is insignificant. Since the univariate results are based on a sub-sample of "pure equity" and "pure cash" bids, this suggests that this result is not uniform across the whole sample. Contrary to prior expectation (see Section 4.3.1) targets acquired in cash offers have higher levels of large shareholding (TAGLGE) than targets acquired in equity offers. This could reflect the fact that this proxy for potential capital gains is measured with some error.

While equity offers have higher levels of directors' shareholdings (BIDDIR) than cash offers, the difference is not statistically significant using the parametric t-test. This is not inconsistent with our prior suggestion of a non-linear relationship between directors' shareholding and the proportion of the acquisition price financed by equity (see Section 4.3.1). At very high and very low levels of directors' shareholding we expect to observe the use of equity. When directors' shareholding is in a middle range where the method of payment can dilute directors' control over the firm then cash offers are used. Due to this non-linear relationship we cannot predict a priori what the average level of directors' shareholding would be in cash offers relative to equity offers.

Consistent with our prior expectation (see Section 4.3.1) cash bidders have higher levels of large shareholding (BIDLGE) than equity bidders (12% for cash bidders compared to 11% for equity bidders). However the

difference is not statistically significant. In multivariate regressions (discussed below) the impact of the presence of large shareholders in the bidder on the method of payment is consistent with our prior expectation and statistically significant.

5.2.2. Merger accounting and acquisition accounting

Table 5.2. reports the results of difference-in-means tests comparing the "merger group" with the "acquisition group". Goodwill as a proportion of the bidder's net assets (GWILL) is higher for bidders using merger accounting compared to those using acquisition accounting. Although the evidence here supports our earlier conclusion that bidders structure the method of payment in order to avoid the negative impact of goodwill write off, it does not provide an answer to the question whether bidders have a preference for using merger accounting as opposed to using acquisition accounting with merger relief.

Table 5.2 is likely to overstate the importance of goodwill write off as a determinant of accounting policy choice because we have not controlled for the difference in the method of payment between the "merger group" and the "acquisition group". While the method of payment is uniform in the "merger group" (i.e, primarily equity) the payment method in the "acquisition group" includes cash. Since bid premia is higher in cash offers than in equity offers (Franks et al, 1988), this could cause goodwill to be higher in the "acquisition group" than in the "merger

Table 5.2.

Difference in means between the "merger group" and the "acquisition group": Univariate tests.

The "merger group" represents bids where the bidder has used merger accounting and the "acquisition group" represents bids where the bidder used acquisition accounting. The "merger group" has 54 observations and the "acquisition group" has 439 observations. The means for the "acquisition group" and "merger group", the t-Statistics testing the difference in group means assuming both unequal and equal group variances and the non-parametric Mann-Whitney-Wilcoxon test are reported. The variables are defined in Table 4.1.

Variable	Mean For Acquisition group	Mean For Merger group	t-Stat Assuming Unequal Variance	t-Stat Assuming Equal Variance	Mann-Whitney-Wilcoxon Test
GWILL	0.74	2.51	1.94**	3.61***	5.26***
DISRES	0.29	0.35	1.03	0.51	0.03
PAYOUT	0.41	0.37	0.93	0.90	2.19***
DEPFA	0.87	0.77	1.47*	0.97	0.77
PROFIT	1.08	1.28	0.89	0.77	1.44
BIDSIZE (£M)	472.15	112.13	5.02***	2.05**	5.43***
LOG OF BIDSIZE	4.81	3.50	6.21***	5.35***	5.43***
TAGSIZE (£M)	68.54	52.12	1.03	0.59	0.62
LOG OF TAGSIZE	2.92	2.98	0.31	0.29	0.62
BIDGEAR	0.28	0.29	0.44	0.45	0.85

Note:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively, one tail test.

group"⁸. In Table 5.4 below we compare the size of goodwill for bidders using merger accounting with bidders using acquisition accounting while controlling for the method of payment.

In Table 5.2 we can see that apart from goodwill the only other variable which appears to affect the choice of accounting method strongly is the size of the bidder. Consistent with our a priori expectation based on the political cost hypothesis (see Section 3.3.6) we find that bidders using acquisition accounting are larger than those bidders using merger accounting.

The size of the target (TAGSIZE) has no impact on the choice of accounting policy. Since bidders are about 30 times larger than targets (see Table 4.3) it is probably not surprising that the impact of anti-trust regulatory pressure on the choice of accounting policy is more closely related to the size of the bidder than the size of the target.

Targets acquired by bidders using acquisition accounting have a higher proportion of their net assets made up of depreciable fixed assets (DEPFA). This is consistent with the argument that the opportunities for using provisions and write downs against the target's assets to inflate post acquisition earnings (see Section 3.3.1) are greater the larger the proportion of the target's assets which is composed of depreciable fixed

⁸For evidence that the size of goodwill is positively related to the level of bid premium see Nathan (1988) and Robinson & Shane (1990) discussed in Section 3.4.

assets. However the statistical significance of this result is weak.

Targets acquired by bidders using merger accounting have higher levels of pre-acquisition distributable reserves (DISRES). Although this is consistent with our prior expectation that bidders using merger accounting value access to the target's pre-acquisition reserves (see Section 3.3.3), the difference is not statistically significant. If access to the target's pre-acquisition reserves is important for bidders using merger accounting, then we would expect such bidders to have high dividend payout ratios (see Section 4.3.1). We find that bidders using merger accounting have lower dividend payout ratios (PAYOUT) than bidders using merger accounting indicating that access to the target's pre-acquisition reserves is not a significant factor in the choice of accounting policy.

5.2.3. Merger accounting and acquisition accounting with merger relief

In Table 5.3, we report the accounting method employed categorised by the ability of the bidder to use merger accounting. Out of the 439 (cases 2 to 5) bids in which the bidder used acquisition accounting, the method of payment precluded the use of merger accounting in 282 (cases 4 & 5) of these bids. We therefore, focus on those cases where the acquirers had a genuine choice between the two accounting methods, ie, cases 1 to 3.

Out of a total of 211 such bids only 54 bids (case 1)

Table 5.3

Accounting method employed partitioned by the ability of the bidder to use merger accounting.

A bidder is qualified to use merger accounting if $PM_i \geq 90\%$ and the bidder's pre bid shareholding in the target is less than 20%. PM_i is the proportion of equity in the final offer price.

Case	Bids where the bidder	No of bids.
1	Used merger accounting	54
2	Qualified to use merger accounting but used acquisition accounting with merger relief	137
3	Qualified to use merger accounting but used acquisition accounting without merger relief	20
4	Not qualified to use merger accounting but used acquisition accounting with merger relief	127
5	Not qualified to use merger accounting but used acquisition accounting without merger relief.	155
Total		493

actually resulted in the use of merger accounting. Of the 157 (cases 2 and 3) bids where the bidder could have used merger accounting but didn't, 137 (case 2) resulted in the bidder using acquisition accounting with merger relief. In Table 5.4 we compare bids where the bidder used merger accounting (merger group) with bids where the bidder was qualified to use merger accounting but instead used acquisition accounting (qualified acquisition accounting group) in terms of the determinants of accounting policy choice.

Although the goodwill write off is still larger for the "merger group" than the "qualified acquisition

Table 5.4.

Difference in means between the "merger group" and the "qualified acquisition accounting group": Univariate tests.

The "merger group" represents bids where the bidder has used merger accounting and the "qualified acquisition accounting group" represents bids where the bidder qualified to use merger accounting but instead used acquisition accounting. The "merger group" has 54 observations and the "qualified acquisition accounting group" has 157 observations. The means for the "merger group" and the "qualified acquisition accounting group", the t-statistics testing the difference in group means assuming both unequal and equal group variances and the non-parametric Mann-Whitney-Wilcoxon test are reported. The variables are defined in Table 4.1.

Variable	Mean For Merger Group	Mean For Qualified Acquisition Accounting Group	t-Stat Assuming Unequal Variance	t-Stat Assuming Equal Variance	Mann- Whitney- Wilcoxon Test
GWILL	2.51	1.27	1.28*	1.59*	3.16***
DISRES	0.35	0.21	1.40*	0.87	0.22
PAYOUT	0.37	0.40	0.69	0.77	1.66*
DEPFA	0.77	0.99	2.23**	1.59*	1.28*
PROFIT	1.28	1.03	0.99	0.94	1.30*
BIDSIZE (£M)	112.14	289.03	3.21***	2.46**	3.97***
LOG OF BIDSIZE	3.50	4.49	4.28***	4.04***	3.97***
TAGSIZE (£M)	42.57	52.12	0.69	0.77	0.52
LOG OF TAGSIZE	2.88	2.98	0.49	0.51	0.52
BIDGEAR	0.29	0.30	1.48*	1.60*	0.69

Note:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively, one tail test.

accounting group" the statistical significance of the difference is weak. Given the ability to use merger accounting, a bidder's decision to do so is only weakly influenced by the size of potential goodwill. This is plausible for at least two reasons. First, under SSAP 23, acquisition accounting in conjunction with merger relief provides some of the benefits associated with merger accounting. Second, acquisition accounting may be combined with provisions at acquisition time and this combination has the effect of increasing the post-acquisition profits of the bidder. These loopholes in the UK rules mean that the distinction between merger and acquisition accounting is often blurred.

The classic dilemma facing managers for example in the USA, in choosing between merger and acquisition accounting is the need to avoid the amortisation of goodwill through the profit and loss account and its consequent adverse impact on future earnings (see Section 3.3.1 for the related discussion). In the UK, the possibility of writing off goodwill against net assets reduces the potency of this choice. The main effect of goodwill write off is, therefore, a reduction in reserves. Even this adverse impact is mitigated to the extent that shares issued as part of the consideration at a premium generate a merger reserve to absorb the goodwill write off.

5.2.4. Summary of the univariate results

The univariate difference in means tests show that

1) the following variables are higher for bidders offering equity as the method of payment: the potential goodwill to be written off as a proportion of the bidder's net assets, gearing, the valuation ratio of the bidder, the valuation ratio of the target, the level of the prebid stock market index and pre-bid growth in the bidder's share price;

2) the following variables are higher for bidders offering cash as the method of payment:- liquidity, free cash flow and size of the bidder relative to the target;

3) goodwill written off is higher for bidders using merger accounting than for those using acquisition accounting. However the size of the goodwill is only slightly larger for those bidders using merger accounting than for bidders who could have used merger accounting but instead used acquisition accounting;

4) bidders using acquisition accounting are larger than those using merger accounting.

5.3. Determinants of the payment method

The simultaneous equations (2A and 2B) in Section 4.4 are estimated by a two stage procedure employing the Two Limit Tobit and Logit methodologies as outlined in Section 4.2.1. To assess whether a single equation model, rather than a simultaneous equations model, is appropriate we also estimate the former with payment and accounting methods as dependent variables. Single equation modelling also allows us to compare our results with those from earlier studies.

Table 5.5 presents the results for the payment method. The Log-Likelihood ratio⁹ shows that both the two stage Tobit model (2STM) and the single equation Tobit (STM) models are highly significant. The Wu-Hausman test statistic (see Section 4.2.3) for the STM is not significant suggesting that the related results may not be tainted by simultaneity bias. All the variables significant in one model are significant in the other with the exception of ACCMET which is not significant in the 2STM model. Each of the significant variables has the expected coefficient sign. The results of the multivariate analysis are consistent with the univariate difference in means tests. This suggests that multicollinearity is not a problem in the multivariate regressions.

Choice of accounting policy (ACCMET) has the correct positive coefficient in the STM model. The difference between the two models as regards ACCMET suggests that a single equation model of the impact of accounting policy choice on payment method may lead us to overstate such impact. Thus such a model may be inappropriate. The non-significance of ACCMET in the 2STM model implies that payment method choice is made independently of accounting method choice. This could be plausibly due to the fact that the availability of merger relief in the UK has blurred the choice between merger and acquisition accounting (see Section 5.2.3).

⁹See Maddala (1989: p.84) for a description of the Log-Likelihood ratio test.

Table 5.5.

Maximum likelihood estimates of Two Limit Tobit models explaining the proportion of equity in the method of payment.

The dependent variable (PM_i) is the proportion of equity in the final method of payment. The explanatory variables are defined in Table 4.1. The sample size is 471⁴.

		Simultaneous Equation Model (2STM)		Single Equation Model (STM)	
Variable	Expected Sign	Coefficient Estimate	t-statistic	Coefficient Estimate	t-statistic
INTERCEPT	?	0.75***	5.14	0.68***	5.30
ACCMET	+	0.10	0.94	0.82***	5.49
GWILL	+	0.02	1.20	0.01	0.20
BIDGEAR	+	0.80***	3.19	0.77***	3.19
TAGGEAR	-	0.11	0.42	0.13	0.54
LOG (RELSIZE)	-	-0.12***	-4.15	-0.11***	-4.30
BIDDIR _{0 TO 0.1}	+	3.41***	2.80	3.57***	3.05
BIDDIR _{0.1 TO 0.25}	-	-1.99**	-1.88	-2.23**	-2.16
BIDDIR _{over 0.25}	+	-0.51	-0.92	-0.42	-0.81
BIDLGE	-	-0.64***	-2.86	-0.62***	-2.94
RETMKT	+	1.17***	3.33	1.11***	3.30
LOG (VRBID)	+	0.09**	2.01	0.09**	2.03
NPDFLOW	-	-0.81**	-1.98	-0.86**	-2.20
BIDCASH	-	-0.46***	-4.12	-0.43***	-4.24
TAGCASH	-	0.01	0.09	0.07	0.69
HOSTILE	-	-0.04	-0.48	-0.02	-0.28
CGAIN	+	0.01	0.04	0.003	0.14
Log-Likelihood		-420.20***		-404.29***	
Wu-Hausman		N/A		-0.40	

Notes:

- 1) ***, **, * Significant at 1%, 5%, 10% respectively, one tail test.
- 2) 2STM = Two stage Tobit model.
- 3) STM = Single equation Tobit model.
- 4) Reduction in the sample size is due to missing observations on some of the independent variables.

The significant positive coefficient on the bidder's gearing (BIDGEAR) is consistent with our a priori belief that highly geared bidders are more likely to use equity because the costs of raising the necessary funds to finance a cash offer are positively related to the firm's level of gearing. This is also consistent with Hansen's proposition C that the probability of an equity offer increases with the financial gearing of the bidder (see Section 2.4.1).

The relative size coefficient (RELSIZE) is negative and significant at the 1% level. This supports the signalling models of Hansen (1987) that large targets are acquired in equity offers to reduce the valuation risk faced by the bidder (see Section 2.4.1).

The significant positive coefficient on $BIDDIR_{0 \text{ to } 0.1}$, indicates that at low levels of shareholdings directors' concern about dilution is minimal, hence as directors' shareholding increase there is an increase in the propensity to use equity offers. The significant negative coefficient on $BIDDIR_{0.1 \text{ to } 0.25}$ shows that with shareholdings between 10% and 25% directors believe that an equity offer will dilute their control, hence as shareholding increase there is a decrease in the propensity to use equity offers. The insignificant negative coefficient on $BIDDIR_{\text{over } 0.25}$ shows that with shareholdings above 25% dilution of control is no longer a major consideration, hence the payment currency is not related to directors' shareholding. These signs are consistent with our prior belief of a nonlinear relationship between directors' shareholding in the bidder

(BIDDIR) and the proportion of the acquisition which is equity financed (see Section 4.3.1). It is also consistent with the results from the univariate difference in means test (see Section 5.2.1).

As an additional test to examine if the relationship is non-linear with two slope changes, we estimated the single equation model (STM) with BIDDIR in linear, squared and cubic form. BIDDIR had a positive coefficient with a t-statistic of 2.038 (p-value = 0.021), $BIDDIR^2$ had a negative coefficient with a t-statistic of -1.919 (p-value = 0.028) and $BIDDIR^3$ had a positive coefficient with a t-statistic of 1.495 (p-value = 0.068). Similar results were obtained for the simultaneous equations model¹⁰.

The negative relationship between the proportion of shares held by external blockholders (BIDLGE) and the probability of an equity offer shows that the concern of large shareholders about the dilution of their holding influences the financing decision of firms.

The significant coefficient on the pre bid return on the market index (RETMKT) is consistent with the existing evidence in the literature that companies make equity issues during rising stock markets when investors may favour such issues. We re-estimated the single equation model (STM) using the return on the bidder's equity (RETBID) in the pre bid period as a proxy for market

¹⁰The single equation model (STM) was also estimated with directors' shareholding (BIDDIR) in linear form only. BIDDIR had a t-statistic of -1.344 (p-value = 0.089). While this result is weakly significant, the results from the non-linear specification are much more powerful.

conditions. RETBID had a positive coefficient with a t-statistic of 2.66 (p-value = 0.001) indicating that bidders also timed the use of equity to coincide with increases in their share price. This is consistent with the Myers & Majluf (1984) misvaluation hypothesis that bidders will make equity offers when their shares are overvalued (see Section 2.4.2). Since from Table 4.4, we know there is some correlation between RETBID and RETMKT, we do not use both variables in the same equation. The significant and positive coefficients on RETMKT and RETBID support our a priori belief that favourable market conditions can influence the method of payment.

The valuation ratio of the bidder (VRBID) has a significant positive impact on the proportion of equity in the method of payment. This supports the Myers (1977) model that firms with growth opportunities are more likely to use equity as a method of financing new investments (see Section 2.9). Since an equity offer lowers the bidder's debt/equity ratio our result is also consistent with the evidence in Smith & Watts (1993) that the firm's valuation ratio is negatively correlated with the debt/equity ratio. To examine if growth opportunities in the target affects the method of payment, we re-estimated the single equation model (STM) using the target's valuation ratio (VRTAG) as a proxy for growth options. VRTAG had a positive coefficient with a t-statistic of 1.463 (p-value = 0.072). This suggests that growth options in the target do affect the choice of payment method but their influence is not as

strong as that exercised by growth options in the bidder.

Free cash flow (NPDFLOW) has a significant negative coefficient. This shows that for low q bidders the proportion of cash used in financing acquisitions increases with their free cash flow. This is consistent with the Jensen (1986) model of free cash flow. To check the robustness of this result we re-estimated the single equation model (STM) using alternative definitions of cash flow (see Table 4.1). The variable WCOFLOW had a negative coefficient with a t -statistic of -2.045 (p -value = 0.021). The variable CFOFLOW had a negative coefficient with a t -statistic of -0.887 (p -value = 0.188). The cash flow from operations definition (CFOFLOW) which conceptually is the most accurate is not significant. A possible explanation is that this measure is subject to a greater degree of noise, because it is more sensitive to accounting practices and adjustments for nonrecurring items (Lang, Stulz & Walkling, 1991)¹¹. Results for the simultaneous equations model are similar.

The bidder's liquidity (BIDCASH) has a significant negative coefficient impact on the proportion of equity in the final consideration, while the target's cash resources do not influence the choice of payment method. This is

¹¹The adjustments required to calculate cash flow from operations (see Section 4.3.1) are based on the assumption that any changes in a non cash current account (ie, items classed as current assets or current liabilities in the balance sheet) relates to an income or expense already reflected in the P&L account (e.g, increase in debtors is income not reflected in cash). Drtina & Largay (1985) show that it is not unusual for current accounts to change without any changes in the current P&L account (e.g reclassification of long term liabilities as current liabilities, inclusion of depreciation in stock under absorption costing).

consistent with the results from the univariate difference in means test discussed in Section 5.2.1 above.

The short run capital gains variable (CGAIN) is not significant in explaining the choice of payment method. When CGAIN is replaced by the shareholding of external blockholders in the target (TAGLGE), a similar result is obtained. In the single equation model, TAGLGE had a t-statistic of -0.653 (p-value = 0.257). One of two inferences can be drawn from this result. Either capital gains tax does not affect the choice of payment method or the proxies we are using are too imprecise to capture the effect of CGT on the method of payment. The former interpretation is in line with previous studies (Franks, Harris & Mayer, 1988; Eckbo & Langhor, 1989; Niden, 1988; Hayn, 1989) which have not found any significant relationship between the announcement period abnormal returns to target shareholders and the potential capital gains tax payable.

5.3.1. Summary of the determinants of the payment method

To summarise the above results, we found that:

1) the following variables have a significant positive impact on the proportion of equity in the method of payment: bidder's gearing (BIDGEAR), the recent return on the market index (RETMKT), the recent increase in the bidder's share price (RETBID), growth opportunities in the bidder (VRBID) and the target (VRTAG);

2) the following variables have a significant negative

impact on the proportion of equity in the method of payment: relative size of the bidder to the target (RELSIZE), percentage of the bidder's shares held by external blockholders (BIDLGE), bidder's free cash flow (NPDFLOW) and bidder's liquidity (BIDCASH);

3) there is a non-linear relationship between directors' shareholding in the bidder and the proportion of equity in the method of payment. When the proportion of the bidder's shares held by directors is low or high, then acquisitions are more likely to be financed by equity.

5.4. Determinants of the accounting policy

Table 5.6 reports the results of estimating the simultaneous equations model (see equation 2B in Section 4.4) for the accounting method choice with the two stage Logit regression (2SLM) procedure outlined in Section 4.2.1. For comparison, the single equation logit model results (SLM) are also presented in Table 5.6. The Log-Likelihood ratio shows that both the simultaneous equations model (2SLM) and the single equation model (SLM) are significant. The Wu-Hausman statistic is not significant suggesting that the single equation approach does not suffer from simultaneity bias.

Both 2SLM and SLM are broadly similar with the same significant variables. Payment method has a decisive impact on accounting method choice with higher equity offers being associated with merger accounting. This is consistent with the 90% equity threshold required by SSAP 23 for a bidder

Table 5.6.

Maximum likelihood estimates of 2 group Logit regressions discriminating between the "merger group" and the "acquisition group".

The "merger group" represents bids where the bidder has used merger accounting and the "acquisition group" represents bids where the bidder used acquisition accounting. The dependent variable (ACCMET) is a dummy variable equal to 1, if the bidder has used merger accounting. The explanatory variables are defined in Table 4.1. The sample size is 471⁴, with 49 and 422 observations in the "merger group" and "acquisition group" respectively.

		Simultaneous Equation Model (2SLM)		Single Equation Model (SLM)	
Variable	Expected Sign	Coefficient Estimate	t-statistic	Coefficient Estimate	t-statistic
INTERCEPT	?	-3.60***	-2.79	-6.43***	-3.23
PM	+	4.68***	3.19	7.82***	3.98
GWILL	+	0.10*	1.63	0.08*	1.44
DISRES	+	0.30	0.55	0.17	0.28
PAYOUT	+	0.09	0.20	-0.37	-0.65
DEPFA	?	-0.21	-0.65	-0.37	-1.09
PROFIT	+	0.07	0.94	0.10	1.15
LOG (BIDSIZE)	-	-0.34**	-2.76	-0.41***	-3.24
BIDGEAR	+	-1.98*	-1.50	-2.65**	-1.82
McFadden's R ²		16.39%		29.21%	
Log-Likelihood		-131.48***		-111.32***	
Wu-Hausman		N/A		1.33	

Notes:

- 1) ***, **, *. Significant at 1%, 5%, 10% respectively, one tail test.
- 2) 2SLM = Two stage Logit model.
- 3) SLM = Single equation Logit model.
- 4) Reduction in the sample size is due to missing observations on some of the independent variables.

to qualify for merger accounting.

The negative and significant coefficient on bidder's size (BIDSIZE) is consistent with the Watts & Zimmerman (1978) argument that large bidders would prefer to use acquisition accounting to avoid the political costs of increased regulation associated with reporting large profit figures. To examine the impact of the size of the target on the choice of accounting policy, we re-estimated the single equation model (SLM) using the natural logarithm of target size (TAGSIZE) as a proxy for the political cost of increased anti-trust regulation. LOG (TAGSIZE) had a negative coefficient with a t-statistic of -0.444 (p-value = 0.329). This is consistent with the univariate difference in means test which showed that due to the smaller size of targets relative to bidders, exposure to increased anti-trust regulation was greater in bids involving large bidders than in bids involving large targets.

Surprisingly we find a significant negative, but relatively weak, relationship between the bidder's gearing (BIDGEAR) and the use of merger accounting. This result directly contradicts a significant body of evidence which has tended to find a positive relationship between the level of gearing and the choice of income increasing accounting policies (see Section 3.3.7). All of these studies which have examined the relationship between gearing and the choice of accounting policy are based on American data. We are not aware of any UK studies which have examined this issue.

It may be that the institutional environment in the UK restricts the discretion of managers in highly geared firms to choose income increasing accounting policies. A possible explanation for this result could be that there is a greater level of monitoring of highly geared bidders by the external creditors, as a consequence of which managerial discretion in choosing income increasing accounting policies is constrained. The pressure from external creditors for the firm to choose conservative accounting policies may explain our results of a negative relationship between the level of gearing and the choice of merger accounting. This issue clearly calls for further examination.

The positive and significant impact of size of goodwill on choice of merger accounting is as anticipated. Although the relative weakness of the impact (significant only at the 10% level) is again consistent with the argument that merger accounting is not the only method of avoiding the adverse impact of goodwill write off.

Other variables such as access to target's pre-acquisition reserves (DISRES), potentially high depreciation charge due to a high level of depreciable assets in the target (DEPFA) or the target's relatively greater profitability (PROFIT) do not influence the bidder's choice of accounting method.

5.4.1. Classificatory accuracy of the Logit discriminant model

A separate issue in any analysis using discriminant methodology is the ability of the model to classify observations accurately into the relevant groups. To assess the classificatory efficiency of the model we use the proportional chance (PC) model as the bench mark (Joy and Tollefson, 1975). The PC model assigns observations to groups with prior probabilities equal to group frequencies.

The bench mark classificatory accuracy (i.e, the rate of correct classification) of the PC model is given by

$$R_{pc} = \sum_{i=1}^n Q_i^2$$

where Q_i = is the prior probability of group i membership (this is equivalent to the proportion of the sample belonging to group i).

The statistical significance of the classificatory power of the model may be tested by the t-statistic

$$t = \frac{R_{disc} - R_{pc}}{\sqrt{\frac{R_{pc} (1 - R_{pc})}{n}}}$$

where n = total sample size and R_{disc} = the proportion of the sample correctly classified by the model.

The classificatory power of the model discriminating

Table 5.7.

Classification matrix for the Logit regressions presented in Table 5.6.

Predicted group is merger accounting if Prob [ACCMET = 1] > 0.1².

Panel A: Classification matrix for the simultaneous equations model.			
	Predicted Group		
Actual Group	Acquisition Accounting	Merger Accounting	Total
Acquisition Accounting	283	139	422
Merger Accounting	8	41	49
Total	291	180	471
Proportion correctly classified		68.79%	
Bench mark based on the proportional chance model		81.36%	
t-statistic		-5.42***	

Panel B: Classification matrix for the single equation model.			
	Predicted Group		
Actual Group	Acquisition Accounting	Merger Accounting	Total
Acquisition Accounting	299	123	422
Merger Accounting	5	44	49
Total	304	167	471
Proportion correctly classified		72.82%	
Bench mark based on the proportional chance model		81.36%	
t-statistic		-4.77***	

Notes:

1) ***, **, * Significant at 1%, 5% and 10% levels respectively.

2) The probability that an observation is classified as merger accounting is set at 10%, to reflect the actual proportion of merger accounting cases in the sample (49/471). This is used as an estimate of merger accounting cases in the population .

between the choice of merger and acquisition accounting (See Table 5.7) is very weak. Both the simultaneous equations model and the single equation model have correct classification rates which were significantly lower than the bench mark specified by the PC model. This results from the high misclassification of acquisition accounting cases as merger accounting. The high misclassification of acquisition accounting cases reflects the fact about 35% of bidders using acquisition accounting actually qualified to use merger accounting (see Table 5.3)¹². The high incidence of bidders using acquisition accounting when they are qualified to use merger accounting reflects the fact that in the UK the ability of bidders to combine elimination of goodwill against reserves with merger relief has sidestepped the classic merger versus acquisition accounting choice (see Section 5.2.3).

The bidder's choice between merger or acquisition accounting appears to be based on a range of more subtle issues not fully captured by our explanatory variables.

5.4.2. Results based on a truncated sample

Following some earlier studies (e.g. Higson, 1990b), we also examine the choice of accounting policy while holding the method of payment effect constant. We compare bids in which the bidder used merger accounting with bids where the bidder used acquisition accounting, but we focus

¹²Table 5.3 and 5.7 have different sample sizes due to missing observations on the independent variables.

on the subsample of bids in which the consideration includes 90% or more of equity. The single equation Logit regression results for this subsample of 199 takeovers are shown in Table 5.8¹³.

These results are consistent with the SLM results in Table 5.6. Large bidders use acquisition accounting to avoid the political costs of large reported earnings. The unexpected negative relationship between the use of merger accounting and the level of the bidder's gearing is also maintained.

Relative profitability is now a significant variable. The univariate difference in means test (Table 5.2 and 5.4) showed that targets were more profitable than bidders in the merger accounting group. However the difference is not significant using the parametric T-test, but significant with the non-parametric MWW test. As this result is not observed across the full sample (see Table 5.6) it is not robust to sampling variation.

The sample used in Table 5.8 is directly comparable to Higson's (1990b). Consistent with Higson's results we find that size and profitability are significant in discriminating between users of merger and acquisition accounting. Higson did not test for the effect of gearing on the choice of accounting method.

The classificatory power of the model in Table 5.8 (see Table 5.9) is better than that of the model in Table

¹³This subsample corresponds to cases 1 to 3 in Table 5.3. Missing observations for some of the independent variables has reduced the sample size from 211 to 199.

Table 5.8.

Maximum likelihood estimates of 2 group Logit regressions discriminating between the "merger group" and the "qualified acquisition accounting group".

The "merger group" represents bids where the bidder has used merger accounting and the "qualified acquisition accounting group" represents bids where the bidder was qualified to use merger accounting but instead used acquisition accounting. The dependent variable is a dummy variable equal to 1, if the bidder has used merger accounting. The sample size is 199², with 49 and 150 observation in the "merger group" and the "qualified acquisition accounting" group respectively. The independent variables are defined in Table 4.1.

Variable	Expected Sign	Coefficient Estimate	t-statistics
INTERCEPT	?	1.56**	1.73
GWILL	+	0.08*	1.36
DISRES	+	0.14	0.24
PAYOUT	+	-0.79	-1.19
DEPFA	?	-0.53*	-1.46
PROFIT	+	0.23**	1.81
LOG (BIDSIZE)	-	-0.37***	-2.85
BIDGEAR	+	-3.08**	-1.92
McFadden's R ²		12.06%	
Log-Likelihood		-97.672***	

Notes:

1) ***, **, * Significant at 1%, 5%, 10% respectively, one tail test.

2) Reduction in the sample size is due to missing observations on some of the independent variables.

Table 5.9.
Classification matrix for the Logit regression presented in Table 5.8.

Predicted group is merger accounting if Prob [ACCMET=1] > 0.25²

Actual Group	Predicted Group		
	Acquisition Accounting	Merger Accounting	Total
Acquisition Accounting	104	46	150
Merger Accounting	13	36	49
Total	117	82	199
Proportion correctly classified		70.35%	
Bench mark based on the proportional chance model		62.88%	
t-statistic		2.181**	

Notes:

1) ***, **, * Significant at 1%, 5%, 10% respectively, one tail test.

2) The probability that an observation is classified as merger accounting is set at 25%, to reflect the actual proportion of merger accounting cases in the sample (49/199). This is used as an estimate of merger accounting cases in the population.

5.6 (see Table 5.7) and the bench mark specified by the proportional chance model. Since bidders using acquisition accounting may not be qualified to use merger accounting the discrimination in Table 5.6 is broader than that in Table 5.8¹⁴. The better classificatory power of the model in Table 5.8 may reflect the reduction of noise in the data.

¹⁴Table 5.6 compares bidders using acquisition accounting with those using merger accounting while Table 5.8 compares bidders using acquisition accounting who qualified to use merger accounting with bidders using merger accounting.

5.5. Robustness checks

The simultaneous equations model results in Tables 5.5 and 5.6 are based on a two stage Two Limit Tobit and Logit methodology where one of the endogenous variables is doubly censored and the other is dichotomous. The t-statistics reported for this model may be inefficient, since they are derived using an inefficient asymptotic covariance matrix (see Section 4.2.2). To assess the severity of this problem, we dichotomise the doubly censored endogenous payment method variable PM by restricting our sample to only those observations where the method of payment is "all cash" or "all equity". The simultaneous equations model is then re-estimated using a two stage Logit methodology (2SLM).

In Table 5.10 we report the results of the 2SLM model for payment method choice (PM) as the dependent variable. The corresponding results for accounting method (ACCMET) as the dependent variable are provided in Table 5.11. In both cases the single equation model (SLM) results are also provided for comparison. The results obtained are similar to those based on the two stage Two Limit Tobit and Logit methodology (Tables 5.5 and 5.6). This indicates that the problem of inefficient t-statistics has no material impact on our earlier conclusions.

There is some evidence on the importance of merger reserve in determining the method of payment. While GWILL has a significant and positive impact on the equity proportion of the consideration (Table 5.10), it has no

Table 5.10.

Maximum likelihood estimates of 2 group Logit model of the choice of the payment method based on the reduced sample of observations either "all equity" or "all cash".

The dependent variable is a dummy variable equal to 1 if the method is "all equity" and 0 if the method of payment is "all cash". The explanatory variables are defined in Table 4.1. The sample size is 252, with 84 and 168 observations in the "all cash" and "all equity" groups respectively.

		Simultaneous Equation Model (2SLM)		Single Equation Model (SLM)	
Variable	Expected Sign	Coefficient Estimate	t-statistic	Coefficient Estimate	t-statistic
INTERCEPT	?	0.96	1.19	0.65	0.85
ACCMET	+	0.11	0.18	2.69***	2.41
GWILL	+	0.64***	2.35	0.54**	2.18
BIDGEAR	+	4.76***	2.85	4.81***	2.79
TAGGEAR	-	-1.24	-1.00	-0.67	-0.53
LOG (RELSIZE)	-	-0.51***	-3.21	-0.47***	-3.15
BIDDIR _{0 TO 0.1}	+	14.15**	2.06	14.76**	2.07
BIDDIR _{0.1 TO 0.25}	-	-8.30*	-1.36	-10.63**	-1.72
BIDDIR _{over 0.25}	+	-2.79	-1.04	-1.74	-0.66
BIDLGE	-	-3.57***	-2.83	-4.15***	-3.13
RETMKT	+	3.95**	2.12	3.75**	2.00
LOG (VRBID)	+	0.09	0.52	0.05	0.32
NPDFLOW	-	-3.14	-1.18	-4.11*	-1.45
BIDCASH	-	-2.55***	-3.54	-2.41***	-3.46
TAGCASH	-	0.29	0.44	0.27	0.43
HOSTILE	-	0.07	0.15	0.18	0.42
CGAIN	+	0.33	1.01	0.36	1.12
McFadden's R ²		31.96%		35.22%	
Log-Likelihood		-109.14***		-103.91***	
Wu-Hausman		N/A		-0.08	

Notes:

- 1) ***, **, * Significant at 1%, 5%, 10% respectively, one tail test.
- 2) 2SLM = Two stage Logit model.
- 3) SLM = Single equation Logit model.

Table 5.11.

Maximum likelihood estimates of 2 group Logit regressions discriminating between the "merger group" and the "acquisition group" based on the reduced sample of observations either "all equity" or "all cash".

The "merger group" represents bids where the bidder has used merger accounting and the "acquisition group" represents bids where the bidder used acquisition accounting. The dependent variable (ACCMET) is a dummy variable equal to 1, if the bidder has used merger accounting. The independent variables are defined in Table 4.1. The sample size is 252, with 42 and 210 observations in the "merger group" and the "acquisition group" respectively.

		Simultaneous Equation Model (2SLM)		Single Equation Model (SLM)	
Variable	Expected Sign	Coefficient Estimate	t-statistic	Coefficient Estimate	t-statistic
INTERCEPT	?	-0.52	-0.52	-1.72	-1.28
PM	+	1.86***	3.09	3.22***	3.06
GWILL	+	0.09	1.24	0.08	0.99
DISRES	+	-0.02	-0.04	0.04	0.06
PAYOUT	+	-0.58	-0.94	-0.62	-0.92
DEPFA	?	-0.73**	-1.83	-0.71**	-1.79
PROFIT	+	0.26**	2.18	0.28**	2.14
LOG (BIDSIZE)	-	-0.31**	-2.28	-0.38***	-2.62
BIDGEAR	+	-2.90**	-1.79	-2.53**	-1.55
McFadden's R ²		18.39%		22.82%	
Log-Likelihood		-92.66***		-87.63***	
Wu-Hausman		N/A		1.47	

Notes:

- 1) ***, **, * Significant at 1%, 5%, 10% respectively, one tail test.
- 2) 2SLM = Two stage Logit model.
- 3) SLM = Single equation Logit model.

significant impact on the choice of accounting method (Table 5.11). This indicates that once again merger relief and merger reserve provide enough flexibility in the treatment of goodwill that merger accounting holds no particular advantage over acquisition accounting even when the potential goodwill is large.

The positive impact of goodwill on payment method choice in Table 5.10 appears to be concentrated at the tail ends of the sample distribution (ie, when payment is 100% cash or 100% equity). Across the whole sample goodwill does not have a significant impact on the payment method (See Table 5.5), while for the sub-samples of pure equity offers and pure cash offers goodwill has a dramatic impact.

With the truncated sample, relative profitability of the target (PROFIT) has a significant and positive impact on the choice of merger accounting while the proportion of depreciable assets in the target's net worth (DEPFA) has a significant and negative impact on the accounting policy choice (Table 5.11). These results are consistent with our prior expectations but are not observed with the full sample (see Table 5.6) and, hence, not quite robust to sampling variations.

About 30% of the takeovers in our sample occurred after the 1987 stock market crash. Since some of our earlier results showed that the level of the market index (see RETMKT in Table 5.5) influenced the choice of payment method, it is reasonable to expect that the market crash of 1987 would cause a decline in the use of equity. We test

for the impact of the stock market crash on the choice of payment method by re-estimating the models in Table 5.5 and including a dummy variable for the stock market crash¹⁵. CRASH had a t-statistic of -3.167 (p-value = 0.001) and -3.131 (p-value = 0.001) in the simultaneous equations model and the single equation model respectively. This confirms that the stock market crash of 1987 had an adverse impact on the use of equity offers in takeovers.

5.6. Conclusion

In this chapter, we present the results of estimating a simultaneous equations model in which the method of payment and the choice of accounting policy are jointly determined. In order to ensure the robustness of our results and to enhance comparability with previous studies, we also repeat our analysis with single equation models and a truncated sample in which payment method is restricted to 100% cash or 100% equity. We find that while the payment method significantly influences the choice of accounting method, the reciprocal impact of the latter is not significant.

There are bid-specific control characteristics which significantly explain the cross sectional variation in the method of payment. Use of equity is positively related to the relative size of the target, the bidder's gearing, the bidder's market-to-book ratio, the target's market-to-book

¹⁵CRASH is dummy variable equal to 1 if the takeover occurred in 1988, 1989 or 1990, otherwise the dummy is equal to 0.

ratio, a rising stock market and rising bidder share price in the pre-bid period. Use of equity is negatively related to the bidder's liquidity, free cash flow and the shareholding of large investors.

Managerial concern about the dilution of control affects the method of payment. Previous studies based on US data found a linear negative relationship between managerial shareholding and the probability of an equity offer. We find a nonlinear relationship between management shareholding and the use of equity.

Preference for merger accounting is negatively related to the size of the bidder. Our results show a negative relationship between the bidder's gearing and the choice of merger accounting. This is contrary to the existing evidence from US studies that highly leveraged firms are more likely to choose income maximising accounting policies. We suggest that greater monitoring of highly geared bidders by creditors in the UK could reduce managerial discretion in choosing an income augmenting accounting policy, i.e, merger accounting.

Consistent with previous US studies, goodwill does have a positive impact on the choice of merger accounting but very weakly so. We note that, in the US, there is a clear-cut choice between merger and acquisition accounting which is blurred in the UK by the ability of bidders to eliminate goodwill by writing it off against reserves. Distinction between merger and acquisition accounting is further eroded by the UK merger relief provisions which

make available many of the benefits of merger accounting even when acquisition accounting is used.

In this chapter, we have concentrated on the method of payment decision from the bidder's perspective. Our analysis of the types of payment methods used in takeovers (see Table 4.2) showed that in 44% of takeovers, bidders offer target shareholders the choice of accepting cash or equity. In the next chapter, we investigate the method of payment decision from the target shareholders' perspective. By concentrating on those takeovers where the target shareholders can choose cash or equity, we attempt to gain an insight into how target shareholders make optimal decisions about which method of payment to accept from the bidder.

CHAPTER 6

TARGET SHAREHOLDERS' CHOICE BETWEEN CASH AND EQUITY CONSIDERATION.

6.1. Introduction

On the 13th of August 1987, Christy Hunt Plc (CH) intervened as a white knight, on behalf of Deritend Stamping Plc (DS), in an ongoing hostile bid from Carclo Engineering Plc (CE). Under the terms of the successful offer from CH, shareholders in DS could either accept 20 shares in CH for every 3 DS or 600p in cash for each DS share. The cash alternative offer was underwritten by Swiss Bank Corporation who were the merchant bankers to CH.

Based on the closing share price for CH on 13/8/1987 (i.e, 127p per share), the equity offer was worth 847p per DS share. When the offer was declared unconditional on 22/9/87, CH had a closing share price of 97p which implied that the equity offer was worth 647p per DS share¹. In this bid, the equity offer was 41% and 8% higher than the cash alternative on the announcement and unconditional dates respectively. Despite the higher premium carried by the equity offer, only 60.50% of DS shareholders accepted it.

This example raises two very interesting questions:

- (i) why did some shareholders accept a cash offer which in monetary terms was clearly inferior to the equity offer?
- (ii) why should the equity and cash offers (which are effectively offers for the same asset) have different

¹On 22/9/87 Deritend Stamping had a closing share price of 610p.

monetary values?.

This chapter provides answers to these questions. Offers in which the target shareholders are provided with the opportunity to accept either cash or equity occur with greater frequency in the United Kingdom than in the United States (Franks, Harris & Mayer, 1988). This is partly due to the differences in the institutional environment in which takeover bids are conducted in the two countries. The City Takeover Code can compel the bidder under certain circumstances to offer cash as a method of payment.

Rule 9 of the City Takeover Code provides that if a person or persons acting in concert acquire 30% or more of the voting rights or when they already have more than 30% acquire 1%² in a 12 month period, then a full bid must be made in cash or must include a cash alternative. Rule 11 of the City code provides that where a person in the last 12 months preceding a general offer purchases 10%³ or more of the voting rights in a company for cash, then a subsequent general offer must be for cash or must include a cash alternative.

An illiquid bidder, required by rule 9 or 11 to make a mandatory cash offer, can side step the problem by making an equity offer but arrange for its bankers to provide a cash alternative. Under the cash alternative, the bidder's

²The relevant percentage during the period (1/1/80 to 31/12/90) covered by the sample in this study was 2%. The change from 2% to 1% occurred on 3/3/93.

³The relevant percentage during most of the period (1/1/80 to 31/12/90) covered by the sample in this study was 15%. The change from 15% to 10% occurred on 26/6/89.

bankers will agree to buy from the target shareholders any shares received under the offer at a pre-determined price. Franks et al (1988) suggest that in addition to providing cash for illiquid bidders the underwriters can act as a means of signalling the true value of the bidder's equity by an informed (or at least partially informed) participant.

A liquid bidder could provide the cash alternative from its own resources. There are several reasons why a bidder with sufficient cash resources would choose to make an offer including both equity and a cash alternative rather than just cash:-

- 1) The equity offer can help the bidder reduce the outflow of cash from the group resulting from the acquisition;

- 2) The equity offer eliminates the need to include a premium to compensate for capital gains tax in the overall bid premium.

In explaining the choice between equity and cash faced by a target shareholder, we present two alternative perspectives on the nature of this decision.

If investors believe that all publicly available information has been accurately impounded into the bidder's current share price, then in making the decision whether to accept the equity offer or the cash alternative, individual shareholders should only be concerned with the relative monetary values of the equity offer and the cash alternative (i.e, the bidder's current share price should

form the sole basis of valuing the equity offer). This is the efficient market perspective which predicts that acceptance of either the cash or equity offer will be primarily influenced by the difference in value between the two offers. *Ceteris paribus*, the efficient market argument suggests that all target shareholders should accept the offer with the higher monetary value.

Alternatively, investors may believe that the value of the equity offer cannot be determined at the date of consummation of the acquisition, since the returns to shareholders accepting the equity offer is affected by the post merger profitability of the enlarged group. Therefore, in addition to the relative monetary values of the equity and cash offers, variables concerned with the economic fundamentals of the acquisition should play a part in the decision models of the target shareholders. This is the market mispricing perspective which suggests that target shareholders will try to evaluate the extent to which either offer reflects the size of post merger gains in deciding whether to accept the cash or equity offer. The market mispricing perspective predicts that acquisitions which are perceived as offering significant post merger returns will attract higher levels of equity acceptances.

In this chapter we empirically evaluate the predictions of the efficient market and the market mispricing arguments. Our results suggest that the behaviour of individual investors is consistent with a belief in market efficiency i.e, that capital markets

efficiently factor information concerned with the economic fundamentals of an acquisition into share prices of both the bidder and the target at the time of announcement of the bid.

We approach the task of explaining the difference in value between the cash and equity offers, by noting that arguments based on risk and capital gains tax (CGT) are not sufficient to justify any difference in value. Although the equity offer is riskier than the cash offer, we show that the higher risk of equity has already been priced by the market and hence cannot affect the difference in value between cash and equity. Similarly we show that, while the cash offer is subject to CGT, an "equity offer with a cash alternative" is tax efficient and hence a tax compensating premium is not required in the cash offer.

Using arguments derived from the options pricing literature we show that the cash offer has incorporated within it a put option written by the bidder, while the equivalent contingent claim against the bidder in the equity offer is an "option to exchange assets". Our results suggests that the difference in value between the cash and equity offers can be explained by the different types of contingent claims against the bidder which are imbedded in the two offers.

6.2. Theoretical background

Once the bidder has chosen an equity offer with a cash alternative as the method of payment, then individual

target shareholders face two different decisions:-

1) is the present offer from the bidder acceptable?

2) if the present offer is acceptable, should I accept the equity offer or the cash alternative?

In the extant literature the first decision facing the target shareholders has been examined (Hoffmeister & Dyl, 1981; Walkling, 1985). In this study we focus on the second decision confronting the target shareholders. This is perhaps the first study which examines the factors likely to influence the target shareholders' choice between equity and cash.

In deciding whether to accept equity or cash, it is inevitable that a wealth maximising shareholder will compare the relative monetary values of the two choices. If there is a difference in the monetary values of the cash and equity offers then we expect that shareholders will be inclined to accept the offer with the higher monetary value.

Should rational shareholders consider any other factors in making their choice apart from the basic issue of the difference in value between the cash and equity offers?. As already outlined there are two alternative viewpoints on this issue: the market mispricing perspective and the efficient market perspective.

6.2.1. Market mispricing perspective

The market mispricing perspective suggests that in deciding whether to accept the equity offer or the cash

alternative, shareholders will be motivated by a variety of considerations, which will include not only the difference in value between the two choices, but also factors concerned with the economic fundamentals of the acquisition.

The starting point for this argument lies in the nature of the two different methods of payment which are being offered. The essential difference between the equity offer and the cash alternative is that of valuation. The value of the cash alternative is certain and is established at the time of the acquisition, whereas the value of the equity offer, which is a risky security, may depend on the post merger performance of the enlarged group. As Weston, Chung & Hoag (1990: p.688) observe:

"The key difference between a cash offer and a risky securities offer is the contingent-pricing effect of risky securities. When securities whose values are related to the profitability of the target are offered, the price of the target is actually determined ex post. When the profitability of the target turns out to be high (low), the value of the security will also be high (low), implying a higher (lower) payment to the target than otherwise."

Implicit in the information signalling models, developed by Fishman (1989), Berkovitch & Narayanan (1990) and Brown & Ryngaert (1991), is the assumption that the price paid for the target can only be determined after completion of the acquisition. These models discuss the role of the method of payment as a signal of the bidder's valuation of the target's assets.

In these models, if the method of payment is uniform, then the bidder cannot credibly communicate any information

which it possesses about the value of the target's assets. Since both high and low value bidders⁴ can undertake acquisitions, it follows that all bidders will be valued as belonging to the same class.

With heterogenous methods of payment, equity offers should come from low valuation bidders while cash offers should come from high valuation bidders. Since in an equity offer, target shareholders participate in any post merger profits, then for any given terms of trade (ie, share exchange ratio) the bidder finds that the cost of the acquisition increases with the gains realised from the merged firm under its management. For this reason an equity offer is not used by a high valuation bidder who prefers to make an immediate cash settlement. By this process the method of payment can act as a signal by which high valuation bidders can reveal themselves.

If the gains generated in the post merger period affect the value of the equity offer, then given their objective of wealth maximisation, target shareholders would only accept the equity offer where the bidder is expected to generate significant value increases in the post-merger period.

The post merger performance of the bidder will be influenced by the economic rationale underlying the acquisition, managerial behaviour and agency conflict (Slusky & Caves, 1991). If shareholders believe that the

⁴A high value bidder is one who values the target's assets highly, ie, expects to realise a significant amount of post merger gains.

value of the equity offer is not determined until a future date, then in making a choice between equity and cash at the present time they will have to consider those fundamental economic factors which are likely to affect the future profitability of the group.

6.2.2. Efficient market perspective

The efficient market hypothesis in the semi-strong form postulates that share prices should rapidly and accurately reflect all publicly available information. If this is true, then upon announcement of the terms and conditions of an acquisition this information should be impounded into the share price of the participating firms.

In an efficient market, we expect that after the announcement of the bid terms the share prices of participating firms in a takeover would very quickly reflect information about the economic fundamentals of the bid and any information which is signalled by the presence or absence of an underwriter. Information impounded in the bidder's share price affects the value of the equity offer. If information concerned about the economic fundamentals is impounded into share prices around the bid announcement period, then the EMH implies that the values of both equity and cash offers are determined at the time of announcement of the bid.

A rational investor therefore has little further use for information concerning the economic fundamentals of the bid in deciding whether to accept cash or equity. The

investor should simply be concerned with the difference between the monetary values of the cash and equity offers.

6.2.3. Relative monetary values of cash and equity offers

The second issue addressed in this chapter is whether the equity and cash offers should have the same value. The answer to this question is not immediately obvious, since it raises issues similar to those addressed in the literature on the irrelevance of dividend policy (see Brealey & Myers, 1984: Chapter 16).

The value of the cash offer is certain while the value of the equity offer is subject to future fluctuations in share prices. It seems reasonable to conclude that the equity offer is more risky and consequently that the value of the equity offer should be higher since target shareholders will demand a premium to compensate for the higher risk of equity. This is similar to the so called "bird in the hand" argument in the dividend irrelevance controversy.

This argument is flawed because it fails to appreciate the true nature of risk. The risk inherent in the bidder's share has already been priced by the market. So long as the bidder's investment opportunity set and future investment policy are not affected by the decision of target shareholders to accept the cash or the equity offer, it is illogical to argue that a target shareholder accepting the equity offer should be paid an additional compensation for risk over the risk premium which has already been impounded

by the market into the bidder's share price.

Let us imagine a new risk averse investor who wishes to buy shares in the bidder. This investor gives up cash which is a safe asset for shares which are risky. In a well functioning market this new investor will expect the future returns from the investment to compensate for the higher level of risk. The risk compensation to a new shareholder is not demanded from existing shareholders since all shareholders are bearing the same level of risk. Target shareholders who give up the option of accepting cash which is a safer security are therefore not entitled to a compensating premium from the existing shareholders.

Target shareholders accepting the equity offer are indeed trading acceptance of a safe asset (ie, the cash offer) for an uncertain future. However those target shareholders who accept the cash offer are not safe because of the decision they made, but because they have converted their assets into cash in the bank. The same position could have been achieved by a shareholder accepting the equity offer, selling the bidder shares and putting the money in the bank.

An alternative argument posits that shareholders accepting the cash offer are subject to capital gains tax (CGT), hence the cash offer should have a CGT compensating premium which is not present in equity offers. Again this argument is faulty, since the "cash or equity" offer is already constructed to be tax efficient. Shareholders who are liable to pay CGT on realised gains (if they accept

cash) are provided with an equity alternative, as a result of which they cannot demand a CGT compensating premium from the bidder.

It is important to realise that CGT is never avoided, only postponed. All shareholders (except tax exempt institutions) will eventually have to pay CGT on the realisation of their assets. An unexpected bid could place target shareholders in the position of having to realise assets at an inopportune moment, hence the justification for demanding a CGT compensating premium. If the bidder provides an equity alternative then the target shareholders are restored to the pre-bid position of being able to choose the appropriate moment when any capital gains are realised. It would be inappropriate once an equity alternative is provided, for target shareholders who accept the cash alternative to demand a CGT compensating premium.

Since the above discussion shows that risk and CGT are not sufficient to justify any difference in the monetary values of the cash and equity offers, we are left with an intriguing question:- are there any theoretically valid reasons for the widely observed value difference between an equity offer and its corresponding cash alternative in the same bid?

Arguments developed from the options pricing literature may offer a way of resolving this issue. During the offer period (ie, the announcement date to the unconditional date) target shareholders do not only own equity in the target firm but also implicit options from

the bidder.

The wealth effect on target shareholders of a bidder's offer can be viewed as composed of two separate parts. There is an initial re-evaluation of the target's underlying share caused by the new information released during the bid process⁵. Additionally the offer from the bidder creates a contingent claim against the bidding firm during the offer period.

The cash and equity offers have distinct options attached to them. In a cash offer a put option is created by which target shareholders can sell their shares to the bidder at the offer price. In an equity offer the corresponding claim against the bidder is an option to exchange two risky assets, ie, target shares for bidder shares (Margrabe, 1978: p.184). During the offer period, trade in the target's shares represents a trade in a complex portfolio, ie, a share with a put option (cash offer) and a share with an asset exchange option (equity offer).

6.2.4. Valuation of the options implicit in the cash and equity offers

The value difference between the cash offer and the equity offer could be due to the different types of options embedded in the respective offers. The value of the option to exchange assets relative to the value of the put option

⁵New information could concern the synergies to be realised by the combination.

could explain why the cash and equity offers have different monetary values. The following example illustrates the valuation issues involved.

Suppose that company **X** bids for company **Y**. The terms of the offer are either a cash price of **C** for every share in **Y** or **x** shares in **X** for every **y** shares in **Y**. Provided **Y** shareholders have decided to sell they have the option to either exchange the risky **Y** shares for risky **X** shares or accept the risk free cash offer.

Value of the put option

Implicit in the cash offer is a put option, which gives **Y** shareholders the right to sell one share in **Y** at an exercise price of **C**. This put option can be valued using the Black-Scholes (1973) formula:

$$P_p = C e^{-rt} N(\sigma_y \sqrt{t} - d) - P_y N(-d) \quad (1)$$

Where

P_p = price of the put option

C = cash offer per target share offered by the bidder

r = daily risk free rate of interest

t = number of days for which the offer remains open

σ_y = standard deviation of **Y**'s daily return

P_y = share price of **Y** excluding the put option

N = cumulative normal density function

$d = [\log (P_y/C e^{-rt}) / \sigma_y \sqrt{t}] + 0.5 \sigma_y \sqrt{t}$

Unfortunately equation (1) cannot be directly applied to compute a value for the put option because the price of

the underlying target share (P_y) cannot be observed. What is observed during the offer period is the composite price of a portfolio of the underlying target share and the put option. Despite this problem, equation (1) provides an insight into the factors that affect the value of this put option i.e, the level of the share price relative to the exercise price (P_y/C), the volatility of the underlying share (σ_y), the time to expiration (t), and the risk free rate of interest (r).

$$P_p = f \left(\frac{P_y}{C}, \sigma_y, t, r \right) \quad (2)$$

Bhagat et al (1987) examined whether the put option imbedded in a cash tender offer was valuable. Based on the prediction from option pricing theory that a portfolio of a stock and a put should have a standard deviation and beta lower than that of the stock itself, they argued that during the tender period target firms should have lower betas and standard deviations than in the pre or post tender period.

For a sample of 295 cash tender offers made over the period 1962 to 1980, they examined the changes in beta and standard deviation of the target around the tender period. The average beta for targets declined from 0.912 in the pre tender period to 0.330 in the tender period, while the decline in standard deviation was from 0.025 to 0.021. The decline in the risk measures from pre tender to the tender period was statistically significant. Average beta increased from 0.330 to 0.729 between the tender and post

tender period (significant at 5%), while standard deviation increased from 0.021 to 0.023 (not significant) over the same intervals. This shows that put options, with sufficient magnitude to affect the risk of the target, are incorporated in cash tender offers.

Value of the option to exchange assets

Incorporated in the equity offer is an option to exchange risky Y shares for risky X shares. The option to exchange risky assets can be valued using Margrabe's (1978) model:

$$P_e = e^{-rt} [P_x N(d) - P_y N(d - \sigma_{\frac{x}{y}} \sqrt{t})] \quad (3)$$

where

P_e = price of the option to exchange assets

P_x = share price of X

P_y = share price of Y

r = daily risk free rate of interest

t = number of days for which the offer remains open

$\sigma_{xy} = \sqrt{(\sigma_x^2 + \sigma_y^2 - 2 \rho \sigma_x \sigma_y)}$

σ_x = standard deviation of X's daily return

σ_y = standard deviation of Y's daily return

ρ = correlation of daily returns on X and Y

N = cumulative normal density function

$d = [\log (P_x/P_y) / \sigma_{xy} \sqrt{t}] + 0.5 \sigma_{xy} \sqrt{t}$

Similar to the problem encountered in valuing the put option above, the value of the option to exchange assets cannot be calculated directly from equation (3) because the

price of the underlying target share (P_y) cannot be observed.

Equation (3) shows that the value of the option to exchange assets is a function of: the relative share price of **X** and **Y** (P_x/P_y), the volatility of the ratio of the share price of **X** and **Y** (σ_{xy}), the time to expiration (t) and the risk free rate of return (r).

$$P_e = f \left(\frac{P_x}{P_y}, \sigma_{\frac{x}{y}}, t, r \right) \quad (4)$$

Value of the difference between the cash and equity offers

The value of the equity offer **E** is equivalent to $x/y \cdot P_x$ (i.e, the share exchange ratio multiplied by the share price of the bidder). The gap between the value of the equity and cash offers (i.e, **E-C**) is caused by the difference in the value of the options embedded in both offers, (i.e, $P_e - P_p$). A comparison of equations (2) and (4) shows that⁶:

$$E - C = f \left(\sigma_y, \sigma_{\frac{x}{y}} \right) \quad (5)$$

We expect that the gap between the equity offer and the cash offer will be:

(i) positively related to σ_{xy} , because the larger is the volatility of the ratio of the share price of **X** and **Y**, the more valuable is the option to exchange assets and so

⁶Although P_y/C and P_x/P_y should affect the gap between the cash and equity offers, they are omitted from equation (5) because P_y cannot be observed.

the more attractive is the equity offer relative to the cash offer;

(ii) negatively related to σ_y , because an increase in the volatility of the return on Y , increases the value of the put option, which reduces the gap between the equity and cash offers.

6.3. Definition of variables

Under the market mispricing perspective of the choice between equity and cash by target shareholders (see Section 6.2.1) the magnitude of potential post merger gains will influence the willingness to accept the equity offer. In the literature the extent of any post merger gains created is dependent on the economic fundamentals of the acquisition which is a function of the available sources of synergy and the agency conflict between managers and shareholders (Slusky & Caves, 1991).

6.3.1. Variables representing the economic fundamentals of the acquisition

Below, we discuss and define several variables which are used as proxies for the economic fundamentals of the acquisition. Under the efficient market perspective, the impact of these variables on merger gains would be impounded into the share prices of the participating firms when the acquisition is announced, hence would not influence the choice of payment method accepted by target shareholders (see Section 6.2.2).

Industrial relatedness (RELATE)

Related mergers offer opportunities for realising synergies from economies of scale and scope (Singh & Montgomery, 1987; Shelton, 1988), while unrelated mergers offer opportunities for realising financial synergies (Lewellen, 1971; Bruner, 1988). The available empirical evidence is inconclusive on whether related or unrelated mergers offer the greatest scope for value creation. Elgers & Clark (1980), Kusewitt (1985), Lubatkin (1987) and Limmack & McGregor (1992) all provide evidence of superior performance in unrelated mergers. Sicherman & Pettway (1987), Scanlon et al (1989) and Datta et al (1992) provide evidence of the superiority of related mergers. Westerfield (1970), and Seth (1990) find little difference between the two merger types. In this study we leave unqualified the direction of influence of relatedness on synergy in an acquisition and on the target shareholders' choice of cash or equity.

RELATE is a dummy variable equal to 1 if the bidder and the target have the same Stock Exchange Industrial Classification (SEIC)⁷ and zero otherwise.

Difference in bidder and target gearing (GEARDIF)

Several authors have argued that there is a debt co-insurance in mergers, since after the merger the creditors

⁷The SEIC classification was obtained from the Risk Measurement Service of the London Business School. The SEIC classification is broadly similar to the 2-digit Standard Industrial Classification (Sudarsanam & Taffler, 1985).

of the participating firms now have the asset backing of both firms. The reduction in the probability of default will allow the merged firm to increase the level of debt in its capital structure. Since debt is tax deductible, there will be a consequent increase in the value of the firm (Lewellen, 1971; Bruner, 1988). The scope for financial synergy in an acquisition is measured by GEARDIF which is defined as the absolute difference in debt capacity between the bidder and the target. Debt capacity is measured as the ratio of total liabilities to total assets. We expect that GEARDIF will be positively related to the magnitude of financial synergy available in an acquisition and the proportion of target shareholders accepting the equity offer.

Complimentary fit of cash resources and growth opportunities (MATCASH)

Opportunities for synergies can arise from a mismatch between the cash resources and growth opportunities of the participating firms. Where one party to an acquisition is cash rich but has low growth opportunities and the other party has high growth opportunities but lacks the cash resources to exploit the growth options, then a merger can creatively exploit this mismatch of resources (Palepu, 1986; Bruner, 1988; Myers & Majluf, 1984). The variable MATCASH which captures this complimentary fit between the

bidder and the target is defined as:

$$(\text{Bidder's expected sales growth rate} - \text{Target's expected sales growth rate}) \times (\text{Target's liquid assets} - \text{Bidder's liquid assets}).$$

Liquid assets are cash plus marketable securities at market value at the last balance sheet prior to the announcement date normalised by net assets. Expected sales growth is proxied by the 4 year average growth rate preceding the acquisition. We expect MATCASH to be positively related to the gains realised in an acquisition and the proportion of target shareholders accepting the equity offer.

Relative performance of the bidder to the target (RELPERF)

Several studies have shown that takeover gains are highest when well managed bidders acquire poorly managed targets (Lang et al, 1989; Servaes, 1991). To measure the performance of a firm we use the Valuation Ratio (VR) (see Section 4.3.1). A large valuation ratio is viewed as an indication of future growth opportunities and hence superior performance. To measure the relative performance of the bidder to the target we use the ratio of the bidder's to the target's valuation ratio (RELPERF). We expect that post merger gains and the proportion of target shareholders accepting the equity offer will be positively related to RELPERF.

Relative size of the bidder to the target (RELSIZE)

Relative size is used to capture the extent to which

the synergistic gains present in an acquisition may be realised. The larger the relative size of the target, the more difficult it is for the bidder to integrate it (Scanlon, Trifts & Pettway, 1989; Hughes, 1989). RELSIZE is the ratio of the market value of the bidder's to the target's equity (see Section 4.3.1). We expect that RELSIZE will be positively related to the size of post merger gains and to the proportion of target shareholders accepting the equity offer.

Director's shareholding in the bidder (BIDDIR)

The greater the level of managerial shareholding the closer is the alignment between managerial and shareholder objective functions (Jensen & Meckling, 1976). However Demsetz (1983) argues that high levels of managerial shareholding would result in managerial entrenchment as managers now control enough votes to defeat any challenges to their authority. BIDDIR is the total of beneficial and non-beneficial shares held in the company by directors of the bidder at the acquisition announcement date (see Section 4.3.1). In accordance with the empirical evidence of a curvilinear relationship between directors' shareholding and the value of the firm (Morck et al, 1988; McConnell & Servaes, 1990), we use BIDDIR in both the linear and quadratic form. At both low and high levels of managerial shareholding we expect to observe large post merger gains and high proportions of target shareholders accepting the equity offer.

Presence of a large shareholder (BIDLGE)

The presence of a large shareholder increases the external monitoring on the bidder's management and hence reduces the scope for managers to take sub optimal investment decisions (Shleifer & Vishny, 1986; Pound, 1988). BIDLGE represents the total of all shareholdings greater than 5% in the bidder (excluding the directors) as reported in the last annual accounts before the announcement of the bid (see Section 4.3.1). We expect that BIDLGE will be positively related to the size of post merger gains and the proportion of target shareholders accepting the equity offer.

6.3.2. Variables representing the dynamics of the acquisition

In addition to any possible influence which post merger gains and the relative monetary values of the cash and equity offers may have on the choice of payment method by target shareholders, there are a variety of factors concerned with the individual circumstance of each shareholder and the characteristics of the bid which may influence their choice.

Capital gains tax is an obvious example. Since the cash offer is subject to CGT, tax exempt shareholders are more likely to accept the cash offer than tax paying shareholders (see Sections 1.2.1 and 2.5). In this section we discuss some of these dynamic factors which might influence the choice of payment method by target

shareholders.

Capital gains tax (CGAIN)

Shareholders accepting the cash offer are liable to pay capital gains tax (CGT) on the disposal of their shares while roll over relief is available for the equity offer (see Section 2.5). Shareholders, liable to pay CGT on the realised gains if they receive cash, can instead accept the equity offer. We expect that the higher the potential CGT liability of target shareholders the higher the proportion of target shareholders accepting the equity offer. CGAIN is defined

$$CGAIN = \frac{\text{Pre-bid Mkt Value Of The Target} - \text{Lowest Mkt Value Of The Target}}{\text{Lowest Mkt Value Of The Target}}$$

The lowest market value of the target over the one year preceding the announcement of the bid is used as a base cost for calculating the short run capital gains payable by target shareholders.

Investor sentiment (RETMKT & RETBID)

The general sentiment of investors could influence the choice of accepting the equity offer or the cash alternative. During a bull market, investor confidence is likely to be high with a consequent willingness on the part of investors to increase the equity holding in their portfolios. In such a bull market it will be easier to

persuade target shareholders to accept the equity offer.

RETMKT measures the cumulative return on the market index during the 80 trading days beginning 120 days before the announcement of the bid. This variable is expected to have a high value when investor confidence and hence the willingness to accept equity are high.

Similarly bidders whose share prices have been rising in the pre-bid period are likely to be more successful in persuading target shareholders to accept their equity.

RETBID measures the cumulative unadjusted return on the bidder's equity during the 80 trading days beginning 120 days before the announcement of the bid.

Presence of an underwriter (UNWRITE)⁸

In an equity offer with an underwritten cash alternative, the underwriters agree that whenever the target shareholders elect to receive the cash alternative, they will purchase the bidder's paper at a predetermined price. The presence of an underwriter can provide a signal to the market of the value of the bidder's paper and hence reduce the information asymmetry problem faced by target shareholders that the equity offered by the bidder is overvalued (see Section 2.4.2). UNWRITE is a dummy variable

⁸If dynamic variables are defined strictly as those factors connected with the individual circumstance of a shareholder which influences the choice of payment method, then the presence of an underwriter isn't a dynamic variable. Additionally under the efficient market perspective any information signalled by the presence of an underwriter would be instantly impounded into the value of the equity offer, suggesting that this variable may not influence shareholders in their choice of payment currency. However since the presence of an underwriter is not related to the economic fundamentals of the acquisition, we have chosen to classify it as a dynamic variable.

equal to 1 if the cash offer was underwritten by a merchant bank.

The definition of variables is summarised in Table 6.1.

6.4. Sample

The sample consists of successfully completed UK takeovers in which the bidder made an equity offer with a cash alternative and is a sub-set of the sample described in Section 4.5. Over the sample period (1/1/80 to 31/12/90), we identified an initial sample of 223 bids in which the bidder offered "equity with a cash alternative" as the method of payment (see Table 4.2). In order to study the choice made by target shareholders with regard to accepting either the cash or the equity offer, it was necessary to collect data on the proportion of target shareholders who accepted the equity offer. This information is occasionally announced by the bidder in a press release at the time the offer is declared unconditional. This data which was collected from the Extel News Cards was only available for 130 bids.

There is a possibility of a selection bias in the sample. It is possible that information on the proportion of target shareholders who accepted the equity offer is only published in bids where the bidder has managed to persuade a large proportion of the target shareholders to accept the equity offer. To examine this possibility the frequency distribution of the proportion of target

Table 6.1.

Choice of payment medium by target shareholders: Definition of explanatory variables.

Variable	Definition
Variables representing economic fundamentals of the acquisition.	
RELATE	Dummy variable = 1, if the bidder and the target have the same SEIC classification otherwise zero.
GEARDIF	Absolute difference in gearing between the bidder and the target.
MATCASH	Difference between the expected sales growth rates of the bidder and the target multiplied by the difference between the liquidity of the target and of the bidder ¹ .
RELPERF	The bidder's valuation ratio divided by the target's valuation ratio ² .
RELSIZE	Market value of the bidder's equity / market value of the target's equity. Market value is at day -41.
BIDDIR	Proportion (%) beneficial & non beneficial shares held by the directors in the bidder at the acquisition announcement date.
BIDLGE	Proportion (%) of all shareholdings greater than 5% in the bidder (excluding directors' shares) at the acquisition announcement date.
Variables representing bid dynamics	
UNWRITE	Dummy variable = 1, If the cash alternative offer was underwritten by the bidder's merchant bankers otherwise zero.
CGT	(Market value of the target at day -41 - lowest market value of the target over the preceding one year) / lowest market value of the target.
RETMKT	Cumulative return in the market index during the 80 trading days beginning 120 days before the announcement of the bid.
RETBID	Cumulative raw returns earned on the bidder's equity during the 80 trading days beginning 120 days before the announcement of the bid.

Notes:

1) Expected sales growth is proxied by the logarithmic growth rate in sales over the five years preceding the acquisition.

2) Valuation ratio is defined as (market value of equity at day -41 plus book value total debt) / book value of total assets.

3) Unless specifically mentioned, all accounting data are drawn from the last financial statement before the acquisition announcement data.

Table 6.2.

Frequency distribution of the variable PROEQUI.

PROEQUI is the proportion of target shareholders who accepted the equity offer.

Range	Sample Size	Frequency	Cumulative Frequency
$0 < \text{PROEQUI} \leq 0.1$	7	5.38%	5.38%
$0.1 < \text{PROEQUI} \leq 0.2$	10	7.69%	13.08%
$0.2 < \text{PROEQUI} \leq 0.3$	10	7.69%	20.77%
$0.3 < \text{PROEQUI} \leq 0.4$	10	7.69%	28.46%
$0.4 < \text{PROEQUI} \leq 0.5$	15	11.54%	40.00%
$0.5 < \text{PROEQUI} \leq 0.6$	16	12.31%	52.31%
$0.6 < \text{PROEQUI} \leq 0.7$	14	10.77%	63.08%
$0.7 < \text{PROEQUI} \leq 0.8$	13	10.00%	73.08%
$0.8 < \text{PROEQUI} \leq 0.9$	12	9.23%	82.31%
$0.9 < \text{PROEQUI} \leq 1$	23	17.69%	100.00%
Total	130	100.00%	100.00%

shareholders accepting the equity offer called PROEQUI, is given in Table 6.2.

The χ^2 goodness of fit that the number of observations in each cell is equal had a value of 13.69 (prob-value = 0.1338). This shows that there is no evidence in Table 6.2 that the bidders who publish information on the proportion of target shareholders accepting the equity offer have higher levels of equity acceptances.

The difference in monetary value between the cash and equity offer fluctuates with movements in the bidder's share price. We measure this difference at different dates during the period from the announcement date to the unconditional date. The value of the equity offer is

calculated as the bidder's share price multiplied by the share exchange ratio. The value of the cash offer is the cash price per target share. The percentage difference between the cash and equity offers is measured as

$$VALDIF = \frac{\text{Value of equity offer} - \text{Value of cash offer}}{\text{Value of cash offer}}$$

The difference is measured at intervals of 10 days from the announcement date to the unconditional date. The distribution of the difference between cash offers and equity offers is given in Table 6.3.

Equity offers are on average 4.60% higher than cash offers. The difference is 4.40% at the announcement date and rises to 5.90% at the unconditional date. Between the announcement date and day +30, the difference is fairly stable. The increase in the difference between the announcement and unconditional date could be due to a rise in the bidder's share price as uncertainty about the success of the bid is resolved. Table 6.3 shows that in quite a significant number of bids (over 25%) the value of the cash offer is higher than the equity offer. The t-test shows that the difference in value between the cash and equity offers is statistically significant throughout the offer period.

6.5. Results

6.5.1. Choice of payment method by target shareholders

In this section we report on the variables which

Table 6.3.

Value difference between equity offers and cash offers.

The difference in value between equity offer and cash offer is calculated as: { (equity offer - cash offer) / cash offer}. The value of the equity offer is calculated as the bidder's share price multiplied by the share exchange ratio. The value of the cash offer is the cash price per target share. The difference is measured at 10 day intervals from the announcement date to the unconditional date.

	Difference at announcement date	Difference at day + 10 after announcement date	Difference at day + 20 after announcement date	Difference at day + 30 after announcement date	Difference at unconditional date	Average difference
Mean	0.044	0.042	0.040	0.042	0.059	0.046
Median	0.038	0.036	0.034	0.023	0.049	0.037
Minimum	-0.110	-0.188	-0.406	-0.462	-0.518	-0.285
Maximum	0.411	0.346	0.428	0.586	0.542	0.392
T-test: Mean = 0	6.529***	5.393***	3.966***	3.639***	4.434***	5.402***
Equity offer > cash offer	94	85	91	83	89	92
Cash offer > equity offer	36	45	39	47	41	38

Note:

1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.

significantly affect the choice between equity and cash by target shareholders.

Impact of the difference in value between cash and equity on target shareholder choice of payment method

In Table 6.4 we relate the proportion of target shareholders accepting the equity offer to the difference in value between the equity offer and the cash offer. In Panel A, the sample is divided into two groups: bids where the cash offer is greater than the equity offer and bids where the equity offer is greater than the cash offer. We find that 65.6% of target shareholders accept the equity offer when the equity offer is higher than the cash offer compared to 37.7% when the cash offer is higher than the equity offer. This difference is significant at better than 1% level. This result is robust to possible deviations from non-normality, since it holds with the non-parametric MWW test.

To get another perspective on the data, in Panel B, we turn the process around. The sample is ranked by the proportion of target shareholders accepting the equity offer. The average difference in value between the equity and cash offers is calculated for each portfolio. This test shows a consistently positive relationship between the acceptance of the equity offer and the difference in value between the equity and cash offers.

Table 6.4.

Impact of value difference between cash and equity offers on target shareholder choice of payment method.

PROEQUI is the proportion of target shareholders who accepted the equity offer. VALDIF is the average of the difference in value between the equity offer and the cash offer measured at intervals of 10 days from the announcement date to the unconditional date. Sample size is 130.

Panel A: Proportion of target shareholders accepting the equity offer in bids where the value of the cash offer is greater than the equity offer and in bids where the value of the equity offer is greater than the cash offer.		
	Sample Size	PROEQUI
Cash offer > Equity offer	38	0.377
Equity offer > Cash offer	92	0.656
t-test	5.66***	
Mann-Whitney-Wilcoxon test	5.065***	

Panel B: Difference in value between the cash offer and the equity offer for portfolios ranked by the proportion of target shareholders accepting the equity offer.		
Portfolio ranking of PROEQUI	Sample Size	VALDIF
0 to 25%	21	-0.007
25% to 50%	31	0.010
50% to 75%	38	0.056
75% to 100%	40	0.090
F-stat	7.56***	

Note:

- 1) ***, **, * Significant at 1%, 5%, 10% levels respectively, one tail test.

Impact of economic fundamentals on target shareholder choice of payment method

In Table 6.5, we relate the acceptance of the equity offer by target shareholders to measures of the potential for realising synergy in the combination. We find that the proportion of target shareholders accepting equity is not significantly influenced by any of the variables measuring the economic fundamentals of the acquisition. This is consistent with the efficient market hypothesis that the influence of these variables on the future profitability of the enlarged group is priced by the market in both cash and equity offers at the time of the announcement of the bid. Target shareholders relying on the efficient impounding of these variables into share prices have chosen to ignore variables affecting the future profitability of the group in their decision of whether to accept the cash or equity offer.

Impact of bid dynamics on the choice of payment method by target shareholders

In Table 6.6, we analyse the effect of bid dynamics variables on the proportion of target shareholders accepting the equity offer. None of the bid dynamics variables has a significant influence on the choice made by target shareholders to accept either the equity or the cash offer.

In Chapter 5, we found that the conditions in the capital markets (RETMKT and RETBID) have a significant

Table 6.5.

Impact of the economic fundamentals of the acquisition on target shareholder choice of payment method.

PROEQUI is the proportion of target shareholders who accepted the equity offer. The independent variables are defined in Table 6.1. Sample size is 130.

Portfolio ranking of PROEQUI	No of obs	RELATE	GEARDIF	MATCASH	RELPERF	RELSIZE	BIDDIR	BIDLGE
0 to 25%	21	0.381	0.124	0.054	0.403	1.983	0.158	0.083
25% to 50%	31	0.452	0.138	-0.045	0.202	1.699	0.159	0.114
50% to 75%	38	0.368	0.106	-0.004	0.215	2.126	0.108	0.152
75% to 100%	40	0.375	0.111	0.042	0.095	1.871	0.068	0.153
F-Stat	130	0.20	0.45	0.51	0.90	0.46	0.98	1.09

Note:

- 1) ***, **, * Significant at the 1%, 5% and 10% levels respectively, one tail test.

Table 6.6.

Impact of bid dynamics on target shareholder choice of payment method.

PROEQUI is the proportion of target shareholders who accepted the equity offer. The independent variables are defined in Table 6.1.

Portfolio ranking of PROEQUI	No of obs	UNWRITE	CGT	RETMKT	RETBID
0 to 25%	21	0.333	0.589	0.037	0.141
25% to 50%	31	0.516	0.463	0.093	0.063
50% to 75%	38	0.553	0.617	0.053	0.134
75% to 100%	40	0.550	0.488	0.077	0.119
F-Stat	130	1.05	0.59	1.59	0.72

Notes:

***, **, *, Significant at 1%, 5%, and 10% levels respectively,, one tail test.

positive impact on the decision of bidders to issue equity (see Sections 5.2.1 and 5.3). It is therefore surprising that these variables have no impact on the choice of payment currency by target shareholders.

Consistent the evidence from chapter 5 that capital gains tax (CGT) does not influence the bidder's choice of payment method (see Sections 5.2.1 and 5.3), we find that the target's choice of payment method is also not affected by CGT. This result probably reflects the fact that the largest investors on the London stock market are institutional investors who are exempt from CGT. Additionally the existence of legitimate means for reducing CGT by tax paying investors (see Section 1.2.1) has eroded the importance of CGT in corporate acquisitions.

There is some weak evidence to support the role of

underwriters in signalling the value of the bidder's paper. Only 33% of bids with the lowest level of equity acceptance (0 to 25%) had an underwriter, while about 55% of bids with equity acceptance greater than 25% had an underwriter. The t-statistic comparing the lowest portfolio (0 to 25%) with the other three portfolios (25% to 100%) had a value of 1.80. (prob value =0.042). This suggests that there is some information signal given by the presence of an underwriter but that this signal does not monotonically increase the level of equity acceptance.

Multivariate regressions

In Table 6.7, we relate the proportion of target shareholders accepting the equity offer to the difference in value between the equity and cash offers, measures of synergy, agency conflict and bid dynamics variables. Since the target shareholders face a binary choice of whether to accept cash or equity, the regressions are performed using the Logit methodology⁹. We estimate the following multivariate logistic regression:

$$\text{Proportion of Target shareholders accepting the equity offer} = f \left(\begin{array}{l} \text{Difference in Value between} \\ \text{cash and equity offers, Synergy} \\ \text{Variables, Agency Conflict,} \\ \text{Bid Dynamics Variables} \end{array} \right)$$

⁹Each individual shareholder faces a binary choice of whether to accept cash or equity for each single share held. If the total number of shares in the target is N and the holders of n shares accept the equity offer, then the proportion of target shareholders accepting the equity offer (n/N) is bounded by 0 and 1. As the underlying variable is binary and not censored, the appropriate methodology is Logit and not the Two Limit Tobit model. For a fuller description see Greene (1991: p.666).

Table 6.7.

Maximum likelihood estimates of Logit models explaining the proportion of target shareholders accepting the equity offer.

Variables	Expected Sign	Model 1	Model 2	Model 3	Model 4
INTERCEPT	?	0.55 (0.27)	0.52 (0.93)	0.08 (0.29)	-0.39 (-0.51)
VALDIF	+	5.87*** (2.72)			5.80** (2.25)
RELATE	?		0.10 (0.23)		0.03 (0.07)
GEARDIF	+		-1.13 (-0.71)		-0.88 (-0.52)
MATCASH	+		-0.35 (-0.73)		-0.32 (-0.62)
LOG OF RELPERF	+		-0.12 (-0.39)		-0.17 (-0.52)
LOG OF RELSIZE	+		-0.04 (-0.28)		0.14 (0.81)
BIDDIR	+		-2.75 (-0.60)		-2.38 (-0.50)
BIDDIR ²	-		2.69 (0.29)		2.43 (0.26)
BIDLGE	+		1.78 (1.31)		1.48 (1.09)
UNWRITE	+			0.29 (0.82)	0.61 (1.23)
CGT	+			0.01 (0.11)	0.02 (0.28)
RETMKT	+			0.95 (0.55)	0.36 (0.17)
ADJ R ²		0.19	0.05	0.00	0.23
Log- Likelihood		-84.39	-72.88	-88.16	-68.907
Sample Size ³		130	111	130	111

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) t-statistics are in brackets.
- 3) Reduction in the sample size is due to missing observations on some of the independent variables.

Consistent with the results in our earlier analysis, we find that the only variable with any significant influence on the choice of accepting equity or cash is the difference in value between the two offers. This supports the efficient market perspective that investors can rely on the market to impound all publicly available information into security prices and simplify the decision facing target shareholders to a comparison of the relative monetary values of the equity offer with the cash offer.

The weak impact which the presence of an underwriter has on the level of equity acceptance can be seen in model 4. The variable UNWRITE would be significant at the 11% level under a one tail t-test.

6.5.2. Difference in value between the cash and equity offer

In this section we examine the determinants of the difference in monetary value between the equity and cash offers. We relate the difference in value between the cash and equity offers to (i) the volatility of returns for the target and (ii) the volatility of the ratio of the bidder's share price to the target's share price (see Section 6.2.4). In Table 6.8, we report the results of estimating the following ordinary least squares regression:

$$\text{Difference in value} = f \left[\begin{array}{l} \text{Variance of target's return,} \\ \text{Variance of } \left(\frac{\text{Bidder's share price}}{\text{Target's share price}} \right) \end{array} \right]$$

Table 6.8.

Regression of the value difference between the cash and equity offer on explanatory variables.

The dependent variable is the difference in value between the equity and cash offers. This is calculated as: $\{(\text{equity offer} - \text{cash offer}) / \text{cash offer}\}$. The value of the equity offer is calculated as the bidder's share price multiplied by the share exchange ratio. The value of the cash offer is the cash price per target share. The difference is measured on the announcement date. TAGSTD is the standard deviation of the target's returns during the pre bid period. RATIOSTD is the standard deviation of the ratio of the bidder's share price to the target's share price during the pre bid period. The pre bid period consists of 250 trading days beginning from 290 days before the announcement date through to 41 days before. The sample size is 130.

Variables	Expected Sign	Model 1	Model 2	Model 3
INTERCEPT	?	0.057*** (2.843)	0.013 (0.574)	0.016 (0.745)
TAGSTD	-	-0.574 (-0.779)		-3.553** (-2.066)
RATIOSTD	+		1.070 (1.373)	3.708*** (2.168)
Breusch-Pagan Test		11.02***	1.10	11.87***
ADJ R ²		-0.003	0.011	0.081
F-STAT		0.637	2.427	6.676***

Notes:

1) ***, **, * Significant at the 1%, 5%, 10% levels respectively, one tail test.

2) t-statistics are in brackets.

The Breusch-Pagan statistic shows that the regression residuals are affected by heteroskedasticity (Maddala, 1989: p.164). Hence the standard errors for the regression coefficients are adjusted for heteroskedasticity using White's (1978) procedure.

In Models 1 and 2, we find evidence which is consistent with our prior expectation that the difference in value between the cash and equity offers is negatively related to the variance of the target's returns and positively related to the variance of the ratio of the bidder's share price to the target's share price. However, the relationships are not very significant. In Model 3, when we include TAGSTD and RATIOSTD in the same regression we find a statistically significant relationship. This suggests that the regressions in Models 1 & 2, may be biased due to omitted variables.

Although, TAGSTD and RATIOSTD are highly correlated¹⁰, multicollinearity is not a serious problem. Maddala (1989: Chapter 7) shows that high inter-correlation among explanatory variables is not necessarily a problem unless it results in the regression coefficients having high standard errors. Maddala suggests that an effective test for the severity of multicollinearity is to examine the stability of the estimated coefficients to random deletion of observations from the sample. We randomly deleted 20 observations from the sample, and re-estimated Model 3 with the reduced sample. Chow's (1960) predictive test for

¹⁰The correlation co-efficient between TAGSTD and RATIOSTD is 0.7723.

stability had an F-statistic of 1.383 (prob-value = 0.1426). This test rejects at the 10% level the hypothesis that the estimated coefficients are sensitive to random deletions of observations from the sample.

These results support our belief that during the offer period, trades in the target's equity represent trades in complex portfolios where the shares have put options and options to exchange assets attached to them. The difference in value between the cash offer and the equity offer results from the difference in the types of claims against the bidder which are incorporated into each offer.

6.5. Conclusion

The Efficient Market Hypothesis (EMH) postulates that all publicly available information about a security can be reduced into a single index: namely the share price. In this chapter, we document behaviour by investors which suggests that market participants behave in a manner consistent with a belief in the EMH.

We examine the factors likely to influence target shareholders in their choice of accepting cash or equity when the bidder offered "equity with a cash alternative" as the method of payment. Consistent with the theoretical predictions based on the EMH, we find that the target shareholders base their choice primarily on the difference in value between the cash and equity offers. Target shareholders appear to be ignoring information concerned with the economic fundamentals of the acquisition and the

future profitability of the combination, because they believe that all relevant information has been accurately impounded into the share prices of the participating firms at the time of announcement of the bid and hence incorporated within the value of the equity offer.

This result suggests that the possession of private information by the bidder about the value of its equity is not relevant to the bargaining process between the bidder and the target on the method of payment. If a bidder attempts to exploit its information advantage about any overvaluation of its equity to the detriment of the target shareholders, the announcement of an equity offer reveals such overvaluation to the market. Any revision in the bidder's share price affects the value of the offer, with the consequent result that target shareholders can make efficient accept or reject decisions, without worrying about the possession of private information by the bidder.

Additionally we find that the difference in value between the cash and equity offers is negatively related to the variance of the target's returns and positively related to the variance of the ratio of the bidder's share price to the target's share price. This is consistent with the predictions from option pricing theory that the cash offer effectively conveys a put option on target shareholders while the equity offer has attached to it an option to exchange risky assets.

In this chapter we have shown that, within the same bid, the equity offer and the cash alternative do not have

the same value. One question that follows from this observation is whether, in different bids the method of payment has a heterogeneous impact on the wealth of shareholders. In the next chapter we review the empirical literature on this subject and in Chapter 8 we investigate the underlying reasons for the documented result that shareholder wealth is affected by the method of payment.

CHAPTER 7

THE IMPACT OF THE METHOD OF PAYMENT ON SHAREHOLDER

WEALTH:- THEORY AND EMPIRICAL EVIDENCE.

7.1 Introduction

There is a considerable body of literature which examines the impact of takeovers on the share prices of bidding and target firms. US and UK studies have been quite consistent in showing that shareholders in target firms gain large and significant abnormal returns around the announcement of takeovers. For the US evidence, see Jensen & Ruback (1983). For the UK evidence, see Franks, Harris & Mayer (1988), Franks & Harris (1989), Limmack (1991) and Sudarsanam et al (1993).

The evidence on the returns to shareholders in the bidding firms is ambiguous. During the period immediately surrounding the announcement of the bid, US studies such as Servaes (1991), Franks, Harris & Titman (1991) and Stulz et al (1990) report small abnormal losses to the bidder's shareholders, while Loderer & Martin (1990), Hayn (1989), Mitchell & Lehn (1990) and Franks, Harris & Mayer (1988) report small abnormal gains. In the UK, Franks & Harris (1989) report small gains to the bidder, while Limmack (1991), Firth (1991), Limmack & McGregor (1992) and Higson & Elliot (1993) report small losses to the bidder. Overall the evidence suggests that while target shareholders experience substantial wealth gains in takeovers, the bidder shareholders at best experience small positive gains

and at worst small wealth losses (Jensen & Ruback, 1983).

Because a lot of the early research examining the share price impact of takeovers was directed at answering the question of whether takeovers were value creating, researchers concentrated on the average wealth experience of all shareholders. The more recent literature is now attempting to disaggregate the data and examine whether shareholders have different wealth experiences in different types of acquisitions.

The theoretical and empirical literature suggests that the method of payment is one of the main variables which influence the announcement period abnormal returns. This chapter discusses the theoretical reasons why the method of payment is likely to influence shareholder wealth on the announcement of a merger and reviews the relevant empirical evidence.

7.2. The impact of the method of payment on shareholder wealth

In a world characterised by perfect markets, symmetric information and no taxes, the type of consideration offered should not have an impact on shareholder wealth. With perfect markets the share price response to a takeover should only reflect the expected synergistic gains resulting from the takeover. Because cash and equity offers are treated differently for capital gains tax (CGT) purposes (see Section 2.5) and the method of payment can be used as a means by which managers can signal any

misvaluation in their shares to the market (see Section 2.4) there may be cross sectional differences in the wealth experience of shareholders consequent on the type of consideration offered.

The empirical evidence documenting such differences in wealth experience is summarised in Tables 7.1 and 7.2.

The event study methodology is the main technique used to measure the impact of takeovers on shareholder wealth (Brown & Warner, 1985)¹. Shareholder wealth changes resulting from the merger announcement is captured in the abnormal return measure. Abnormal return is the difference between the actual return and a control return which measures what the return would have been in the absence of a merger (see Appendix 8.1 below). To measure the impact of an event (ie, the announcement of a takeover) on shareholder wealth it is necessary to define an event window. The event window represents the period during which the impact of the event on the share price of the affected firm is most concentrated. A short event window may not be sufficient to capture all the impact of an event on share prices, while a long event window may introduce noise into the data by capturing price movements which are not connected with the event being studied.

The evidence is quite strong that relative to equity offers, cash offers result in higher returns to both the bidder and the target. This result is robust to differences in institutional environment, methodology, sample size and time period.

Table 7.1

Cumulative abnormal returns to target shareholders around the acquisition announcement date partitioned by the method of payment.

Study	Sample Period & Country	Event Window	Result for Cash Offers [%]	Result for Equity Offers [%]
Wansley, Lane & Yang (1983)	1970-78 US	Day 0	33.45 (102) {na}	17.47 (87) {na}
Huang & Walkling (1987)	1977-82 US	Days -1 and 0	29.30 (101) {na}	14.40 (32) {na}
Franks, Harris & Mayer (1988)	1955-84 US	Months -4 to +1	36.30 (476) {24.8}	15.60 (577) {14.9}
Franks Harris & Mayer (1988)	1955-85 UK	Months -4 to +1	30.50 (241) {11.6}	18.20 (235) {6.34}
Eckbo & Langohr (1989)	1966-82 France	Weeks -8 to +8	28.50 (34) {6.40}	3.90 (31) {120}
Peterson & Peterson (1991)	1980-86 US	Days -30 to completion	10.12 (124) {21.3}	4.88 (86) {8.10}
Servaes (1991)	1972-87 US	Days 0 to completion	26.67 (408) {na}	20.47 (180) {na}
Franks, Harris & Titman (1991)	1975-84 US	Days -5 to +5	33.78 (156) {16.9}	22.88 (128) {12.1}

Notes:

() refers to the sample size
 { } refers to the reported t-statistic
 na means "Not Available"

Table 7.2

Cumulative abnormal returns to bidder shareholders around the acquisition announcement date partitioned by the method of payment.

Study	Sample Period & Country	Event Window	Result for Cash Offers [%]	Result for Equity Offers [%]
Travlos (1987)	1972-81 US	Days -1 and 0	0.24 (100) {1.11}	-1.47 (60) {-5.1}
Franks, Harris & Mayer (1988)	1955-84 US	Months -4 to +1	2.60 (476) {0.89}	0.60 (577) {0.61}
Franks, Harris & Mayer (1988)	1955-85 UK	Months -4 to +1	4.30 (241) {1.98}	1.80 (235) {10.6}
Eckbo & Langohr (1989)	1966-82 France	Weeks -8 to +8	-0.10 (34) {0.10}	-3.60 (31) {-0.70}
Amihud, Lev & Travlos (1990)	1981-83 US	Days -1 and 0	0.44 (83) {1.04}	-1.19 (37) {2.14}
Peterson & Peterson (1991)	1980-86 US	Days -30 to completion	0.26 (124) {0.91}	-1.01 (86) {-0.8}
Brown & Ryngaert (1991)	1981-86 US	Days -1 and 0	-0.06 (166) {-0.14}	-2.48 (62) {-3.32}
Franks, Harris & Titman (1991)	1975-84 US	Days -5 to +5	0.83 (156) {0.68}	-3.15 (128) {-2.8}
Servaes (1991)	1972-87 US	Days 0 to completion	3.44 (172) {na}	-5.86 (142) {na}
Limmack & McGregor (1992)	1977-86 UK	Month 0	-0.15 (96) {1.63}	-2.96 (75) {2.07}

Notes:

() refers to the sample size

{ } refers to the reported t-statistic

na means "Not Available"

A number of different arguments have been offered to explain the higher returns to shareholders in cash offers relative to equity offers. The most commonly cited explanations include information asymmetry between bidder managers and target shareholders, compensation for capital gains tax and the transfer of wealth from shareholders to bondholders.

7.3. Information asymmetry and shareholder wealth

There are two sources of information asymmetry which may affect the returns to shareholders. Either the bidder has superior information about the value of its own assets or the target has superior information about its assets.

7.3.1. Overvaluation of the bidder and shareholder wealth

The Myers & Majluf (1984) model predicts that the bidder's managers will make an equity offer when they believe that their shares are overvalued (see Section 2.4.2). If target shareholders suspect that the bidder's managers will behave in such an opportunistic manner, any equity offer will be treated as bad news, while a cash offer will be treated as good news. This information effect implies that, other things being equal, abnormal returns to bidders will be higher in cash offers than in equity offers.

The downward revaluation of the bidder's shares resulting from an equity offer should not influence the returns to the target, since target shareholders can demand

additional shares from the bidder to compensate for the fall in the bidder's share price.

The amount of information asymmetry existing between bidder managers and target shareholders is not homogeneous across all takeovers because the availability and reliability of information are company specific. The difference between the bidder managers' and the target shareholders' perception of the value of the bidder will be directly related to the amount of information asymmetry. For any large firm with a substantial amount of high quality information in the public domain, the difference between the market valuation and managerial valuation of the firm will be small, since managers and investors are likely to be sharing the same information.

If information asymmetry about the bidder's shares is high, *ceteris paribus*, the downward revaluation resulting from an equity offer and the upward revaluation caused by a cash offer will also be high. This leads to the following hypothesis:-

'Bidder's information asymmetry hypothesis, H1': Returns to bidder shareholders and the amount of information asymmetry about the value of the bidder existing between bidder managers and target shareholders will be positively related in a cash offer and negatively related in an equity offer.

7.3.2. Uncertainty about value of the target and shareholder wealth

Where the target has superior information about the value of its assets, then the bidder will have to incur real costs in carrying out a pre-merger appraisal of the target (ie, the due diligence audit). If despite its pre-merger appraisal, the bidder is not fully informed about the true value of the target's assets, the bidder will prefer to make an equity offer, since the target's shareholders will now share in the future risks of the enlarged group. This reduces the bidders' adverse selection problem (see Section 2.4.1).

If however the pre-merger appraisal establishes that the target has a high value, then the bidder will prefer to make a cash offer. The objective of the cash offer is to capture as much of the takeover gains as possible by not allowing target shareholders to participate in any post merger gains (Fishman, 1989; Berkovitch & Narayanan, 1990; Brown & Ryngaert, 1991). This is similar to the argument advanced under the market mispricing perspective of the choice facing target shareholders between equity and cash (see Section 6.2.1).

As the results in Chapter 6 show, this argument is flawed since the market discounts information about the gains realisable in an acquisition into share prices at the time of announcing the bid. If target shareholders believe that they are not receiving a fair share of the merger gains, then they can either demand a higher cash price from

the bidder or refuse to sell. Additionally, it is difficult to believe that the bidder can use the method of payment as a means of preventing anyone from participating in post merger gains¹, since in an open market, target shareholders can accept the cash offer and invest the proceeds in the bidder's shares.

In Hansen's (1987) model uncertainty about the value of the target will result in an equity offer as the bidder seeks to minimise the valuation risk of discovering, ex-post, that it has overvalued the target (see Section 2.4.1). Since the equity offer is a result of the bidder's uncertainty about the value of the target, it is likely that the premium offered to the target will be smaller as result of this uncertainty.

If the bidder's uncertainty about the valuation of the target's assets is high, this results in an equity offer and a correspondingly low bid premium. When the bidder's uncertainty about the valuation of the target's assets is low this results in a cash offer. However there is no reason to presume that the accompanying bid premium will be affected by the reduction in the uncertainty surrounding the value of the target. This leads to the following hypothesis:

¹The bidding managers can only hope to prevent the target shareholders from demanding a share of any merger gains, if all information about gains realisable from the acquisition is not released to the market at the time of announcing the bid. However, this information cannot be selectively and secretly released to just the bidder's shareholders existing at the date of announcing the bid.

'Target's information asymmetry hypothesis, H2': In an equity offer, returns to the target shareholders are negatively related to the amount of information asymmetry between the bidder and target. In a cash offer, information asymmetry has no effect on the returns to the target shareholders.

7.4. Taxation and shareholder wealth

In a cash offer the CGT liability of target shareholders crystallises immediately, while in an equity offer the CGT liability can be deferred to a later date. Hence bidders may have to pay a higher acquisition price in a cash offer relative to an equity offer, in order to compensate target shareholders for the associated CGT burden (see Section 2.5).

In the UK the rollover of CGT applies to the equity component of the total consideration irrespective of the mix, while in the US at least 50% of the total consideration must be in the form of equity in order for the rollover relief to apply (Brown & Ryngaert, 1991). The higher premium needed to compensate the target's shareholders for capital gains tax implies that *ceteris paribus* the target should experience higher returns in cash offers than in equity offers, while the bidder should experience lower returns in cash offers than in equity offers.

In the US prior to the US Tax Reform Act of 1986 bidders made tax gains at the corporate level which offset

the higher premium required to compensate the target shareholders. The principal source of this tax gain is the step-up in the basis for tax depreciation when the target's assets have a fair market value which exceeds the undepreciated balance of those assets for tax purposes in the target's books.

Under the step-up principle, in a taxable acquisition², the bidder can step up the target's asset to the purchase price and depreciate this higher amount, resulting in a reduction of the future tax liability of the new group, since capital allowance deductions are higher than would have been available to the two firms separately. The tax gains resulting from asset step-up can offset the higher premium paid to compensate target shareholders for their CGT liability.

In the US, although CGT compensation implies that the target would have a higher premium in a cash offer than in an equity offer, this higher premium has not necessarily been gained at the bidder's expense, since the asset step-up offsets this higher premium. There is no such offset in the UK. Any higher premium which is offered to the target shareholders must be at the expense of the bidder. In the UK, if CGT were the only market imperfection we would not

²In the USA, the tax consequences of an acquisition for the bidder depends on the tax status of the acquisition for the target's shareholders. In a taxable acquisition the target's shareholders realise a gain or loss on their shareholding in the year of the acquisition. In a tax free acquisition the recognition of the gain or loss is deferred until a future taxable event occurs. In a taxable acquisition the bidder can step-up the value of the target's assets. However step-up is not available in a tax free acquisition. See Hayn (1989) and Niden (1988) for a summary of the relevant conditions to qualify as a tax-free acquisition.

expect to see any cash offers.

If a CGT compensation premium is present in cash offers, then this compensation is greater, the larger is the realisable capital gain. Since equity offers do not result in the realisation of CGT liability there is no relationship between the returns to target shareholders and the potential CGT realisable in an acquisition. This leads to the following hypothesis:-

'Capital gains tax hypothesis, H3': In a cash offer, the returns to the target shareholders are positively related to realisable capital gains, while the returns to the bidder shareholders are negatively related to realisable capital gains. In an equity offer, realisable capital gains have no impact on the returns to the bidder and target shareholders.

7.4.1. Empirical evidence on the impact of taxation on shareholder wealth

As the majority of the evidence in this area comes from the US, most of the studies examine the impact of CGT compensation and asset step up on shareholder wealth. The most common approach is to regress the announcement period abnormal returns on proxies for the potential CGT payable by target shareholders³ and the tax savings available from asset step up by revaluing the target's assets.

Carleton et al (1983) (reviewed in Section 2.12) found

³The difficulties involved in measuring the potential CGT payable by target shareholders have been discussed in Section 4.3.1.

evidence that the market-to-book value ratio of the target was positively correlated with the probability of an equity offer. They interpreted this as evidence consistent with the tax compensation hypothesis on the assumption that the market-to-book value ratio was a reasonable proxy for the potential capital gains tax liability of target shareholders. However, their interpretation of this result is suspect. The book value of assets is a very weak proxy for the CGT base cost of target shareholders, hence the market-to-book value ratio is a very crude empirical proxy for potential capital gains tax liability.

Auerbach & Reishus (1988) examined the role of tax benefits as a motivating factor in takeovers. They used a sample of 318 mergers over the period 1968-83. For each merger in the sample, a corresponding "pseudomerger" was created by randomly selecting a "pseudotarget" and a "pseudoparent" from all firms in the same size class as the target and the bidder respectively. They used a Logit model to test whether the tax benefits available in actual mergers were greater than the potential benefits available in the control sample of "pseudomergers". None of the variables in the model directly tested the hypothesis that cash offers contain a CGT compensating premium. However several of the variables were proxies for the potential benefit from the asset step-up. They found that the tax benefits from asset step-up was on average 1.8% of the target's value in actual mergers and 2.1% in pseudomerger. The difference between the two samples was insignificant.

In the multivariate Logit models, the asset step-up variable was insignificant.

Auerbach & Reishus had to make a number of assumptions in order to estimate the tax benefits asset from step-up. Their estimates are likely to be subject to substantial error which could understate the potential tax benefits in cases where the target's depreciable assets have been held for many years or where the assets have appreciated in value at a rate exceeding the inflation rate. It is possible that estimation errors could explain the low explanatory power of the asset step up variable. Hayn (1989) who uses a more reliable method to estimate asset step-up benefits found more positive results⁴.

Hayn (1989) examined whether the announcement period abnormal returns to both the bidder and the target was affected by the tax consequences of the acquisition (i.e, the CGT payable by target shareholders and the potential step up in the target's assets). Her sample consisted of 116 firms involved in taxable acquisitions over the period 1970-85. She regressed the announcement period (days -30 to completion) abnormal returns to the bidder and target shareholders on proxies for asset step-up and the potential

⁴Auerbach & Reishus estimated the tax benefits from basis step-up as the difference between the market value of the target's depreciable assets and its cost. They estimated the market value of the assets by multiplying the cost of the asset by the GNP deflator for the period between the year of purchase and the year of merger. Hayn estimated the tax benefits from basis step-up as the difference between the value of the target's depreciable assets in the bidder's book and their value in the target's book.

CGT liability of target shareholders⁵. She found that asset step-up was significant and positively related to the announcement period abnormal return for both the bidder and the target. Potential capital gains tax was significant and positive for target firms but negative and insignificant for bidding firms. The coefficients on the CGT variable for target and bidding firms were of about the same magnitude but of opposite signs. Hayn argued that this suggested a zero-sum effect for capital gains tax on the two groups of shareholders (i.e, that the CGT compensating premium is paid to the target out of the bidder's share of the merger gains). However, there is some doubt on this interpretation given that bidders are larger than targets.

Peterson & Peterson (1991) examined the role of taxes, type of offer and the medium of exchange in explaining shareholder returns using a sample of 130 mergers over the period 1980-86. They regressed the announcement period abnormal returns (days -30 to completion) to the bidder and target shareholders on proxies for the asset step-up and CGT payable by target shareholders. To measure CGT payable by target shareholders, they used an interaction variable which incorporated the taxability of the offer and the tax

⁵The proxy for CGT payable by target shareholders was derived as the product of four components: (a) the difference between the target's share price 40 days before the announcement date and the lowest share price over the preceding six months, which captures short term capital gains (b) one minus the average turnover ratio of the target's shares over six months preceding the bid, which captures the likelihood that a given gain will be recognised as short term. In the US, prior to the 1986 Tax Reform Act, gains accrued over a long holding period were taxed at the lower capital gains rate, whereas gains realised over a short period were taxed at the higher rate on ordinary income (c) the difference between the marginal individual tax rate and the long term capital gains tax rate (d) the number of outstanding shares. Hayn did not provide any explanation for the choice of this variable.

status of the target's shareholders. This variable equals 0, if the offer was tax exempt (i.e, no CGT is payable) and equals the percentage holding of non-institutional shareholders otherwise⁶. Their hypothesis was that the coefficient on this variable should be positive if the target's shareholders are compensated for the tax burden associated with cash offers. The variable was significantly positive at the 5% level.

However, it is difficult to accept the conclusion by Peterson & Peterson that this evidence supports the CGT compensation hypothesis⁷. We know that most cash offers are also taxable offers. Hence the use of this interaction variable to test the CGT compensation hypothesis is unsatisfactory, since any other theory which predicts a higher return to cash offers would also be consistent with a positive coefficient.

Peterson & Peterson proxied the basis step-up with a variable which equalled 0 for a non taxable acquisition and the ratio of accumulated depreciation to the depreciation expense in the target otherwise⁸. This variable had a significant and positive effect on the target's returns but

⁶Since institutional shareholders are likely to be tax exempt, this variable presumably measures the proportion of tax paying shareholders in taxable acquisitions.

⁷An equity offer is likely to be a tax free offer, for which this variable will have a value of zero. A cash offer is likely to be a taxable offer, for which this variable has a non zero value (i.e, proportion of shares held by a non-institutional shareholders). Since cash offers have a higher return than equity offers, then by its construction, this variable must have a positive coefficient, irrespective of how the non zero value is defined.

⁸Peterson & Peterson provide no explanations for their choice of variables.

an insignificant and negative sign on the bidder's returns. It is doubtful whether this variable is capable of capturing the potential for asset step-up as we see no relationship between historical cost depreciation and the market value of the target's assets. Peterson & Peterson concluded, contrary to Hayn (1989), that asset step-up had an insignificant role in the distribution of merger gains. It is possible that this different conclusion is driven by the crude nature of the proxy employed by Peterson & Peterson.

Franks, Harris and Mayer (1988) is the only study to test the CGT compensation hypothesis for the UK. They compared the target's bid premium for cash offers relative to equity offers for the periods 1955-64 and 1965-85. Since a full capital gains tax was first introduced in 1965, the bid premia in cash offers should differ from equity offers only after 1965. Contrary to this they found that the bid premium was higher in cash offers than in equity offers both before and after the introduction of CGT.

This empirical evidence does not support the CGT hypothesis. This isn't surprising since in earlier discussions (see Sections 1.2.1 and 2.5) we have shown that the impact of CGT on the wealth of tax paying investors in the UK, can be mitigated by the annual tax exemption limit, the availability of indexation allowance, the use of personal equity plans etc.

7.5. Debt co-insurance and shareholder wealth

An acquisition can result in wealth transfers between shareholders and bondholders (see Section 1.3.3). Higgins & Schall (1975) show that where the total income stream⁹ of the merged firms are not perfectly correlated, there will be some future state in which although one of the merged firms is unable to pay its debt, the combined firm would be able to meet its debt obligations. However no future state can exist where the combined firm is unable to pay its debts but one of the merged firms can still meet its own obligations. This dominance condition exists because the lack of correlation in cash flows results in a greater probability that a given level of combined debt payments will be met. Since the combined cash flows and hence the value of the combined firm has not increased but the value of debt has increased (due to the reduced risk of bankruptcy) this implies that the value of equity must have fallen.

Galai & Masulis (1976) establish the wealth transfer effect using the Option Pricing Model (OPM). If the correlation coefficient between the returns of the merging firms is sufficiently low or negative, the variance of the merged firm's returns will decrease. From the OPM, reduced variability reduces the value of the option. Since equity is an option on the firm's assets, its value will fall with

⁹The income stream to both shareholders and bondholders.

a decrease in the variance of the merged firm's returns¹⁰.

The correlation of returns of the merging firms can be either positive or negative, hence the variance of the combined firm's returns may be less than the variance of the individual firms or greater than one of the firms and less than the other firm. Shastri (1982) relaxes the Galai & Masulis assumption that the variance of the combined firm's returns is less than the sum of the variances of the individual firms' returns. He shows that the effect of the merger on the value of the combined firm's equity can be ambiguous and depends on how the variance of the combined firm's returns is related to the variance of returns of the individual firms. The relationship between the variance of returns of the merged firm, the variance of returns of the individual firms and the value of equity is summarised in Table 7.3.

In case 1, the variance of the combined firm's return is less than the variance of firm A's returns but greater than the variance of firm B's returns. Hence the merger reduces the risk of firm A's debt and increases the risk of firm B's debt. The fall in risk increases the value of firm A's debt while the increase in risk reduces the value of firm B's debt. The effect of the merger on each individual firm's equity would depend on the share exchange ratio, hence the equity of firm C could either increase or

¹⁰Equity is a call option written on the firm's assets with an exercise price equal to the face value of debt. When the value of the firm's assets exceed the face value of debt, equity is in the money, otherwise it is worthless.

Table 7.3.

The effect of variance changes on the value of debt and equity.

Case	Variance of returns	Debt A	Debt B	Equity C
1	$\sigma_A > \sigma_C > \sigma_B$	> 0	< 0	> 0 or < 0
2	$\sigma_A < \sigma_C < \sigma_B$	< 0	> 0	> 0 or < 0
3	$\sigma_A, \sigma_B > \sigma_C$	> 0	> 0	< 0
4	$\sigma_A, \sigma_B < \sigma_C$	< 0	< 0	> 0

Notes:

1) A and B are the merging firms, while C is the combined firm.

2) σ_A , σ_B and σ_C represent the variance of returns to firm A, B and C respectively.

decrease in value. In case 3, the variance of the combined firm's returns is less than the variance of returns of both firms A and B. The merger reduces the risk of both firms' debt. The value of the debt for both firms would increase with the result that the value of the combined firm's equity will fall. This is more easily accomplished in conglomerate mergers where by definition the returns of the merging firms are not correlated. In case 4, where the merger increases the risk of debt for both firms' A and B, the value of debt in both firms falls and the value of the combined firm's equity rises.

Any redistribution of wealth from shareholders to bondholders is more severe in equity offers than in cash offers (Eger, 1983; Travlos, 1987). In a cash offer, significant resources leave the group hence reducing the asset backing available for debt and eroding the opportunities for a transfer of wealth from shareholders to

bondholders. Furthermore, the redistribution theory requires that the cash flows of the two firms must be combined. With resources leaving the group in a cash offer, the asset base for generating operating cash flows falls hence the post merger operating cash flows will change. In a cash offer the cash flows of the combined firm, cannot be viewed as a simple addition of the cash flows of the merging firms.

If wealth redistribution from shareholders to bondholders, as result of changes in default risk, is larger in equity offers than in cash offers, this gives rise to the following hypothesis:-

'Wealth transfer hypothesis, H4': The returns to both the target's and the bidder's shareholders will be negatively related to the change in risk of the merged firm's returns, however the relationship between the change in the variance of the merged firm's returns and the returns to the bidder and target shareholders will be stronger in an equity offer than in a cash offer.

7.5.1. Empirical evidence on the wealth redistribution effect

Most of the evidence on the wealth redistribution effect has been obtained by examining the announcement period abnormal returns to the publicly quoted bonds of firms participating in takeovers. If wealth is transferred from shareholders to bondholders, then bondholders should experience positive announcement period abnormal returns.

Asquith & Kim (1982) examined the returns to bondholders involved in conglomerate mergers for a sample of 50 mergers over the period 1960 to 1978. For the announcement month they found statistically insignificant positive abnormal returns of 1.07% ($t=1.66$) for the entire sample of bonds (both bidders' and targets' bonds). However the Cumulative Abnormal Returns (CAR) diminish in the months following the announcement month, suggesting that while there may be a positive wealth effect in the announcement month, it is not sustained. When the sample is partitioned into bidders and targets similar results are obtained. In the announcement month, the bidder's bondholders gain 1.08% ($t=1.15$), while the target's bondholders gain 1.05% ($t=1.23$). In the month following the bid announcement, the bidder's bondholders lose -1.06% ($t=-1.21$), while the target's bondholders lose -1.58% ($t=0.93$) over the period months +2 to +5.

If a wealth redistribution effect exists, it should be larger for those bids where the cash flows of the participating firms are not correlated. Asquith & Kim calculated the Spearman rank order correlation coefficients between bondholders returns and the correlation coefficient of the returns for each pair of merging firms. For the entire sample the Spearman correlation coefficient of -0.0807 (p-value = 0.328) was insignificant. In this test Asquith & Kim did not make any adjustment for the relative sizes of the merging firms and this may partly account for their insignificant results.

Dennis & McConnell (1986) examined the returns to convertible and non-convertible bondholders for a sample of 132 mergers over the period 1962 to 1980. Over the 13 day event window (-6 to +6) the target's convertible bonds earned a CAR of 8.92% ($t=2.38$) while the non-convertible bonds earned a CAR of -0.28% ($t=-0.29$). The bidder's convertible bonds earned a CAR of 2.45% ($t=1.46$), while the non-convertible bonds earned a CAR of -1.12% ($t=-1.11$). These results indicate that contrary to the wealth redistribution hypothesis, non-convertible bonds appear to suffer losses around the date of merger announcement while convertible bonds gain.

Dennis & McConnell attribute the difference in the wealth experience of convertible and non-convertible bonds to the difference in their treatment under the terms of the merger. For the entire sample, convertible bonds were exchanged for some combination of equity, bonds and cash, while non-convertible bonds were merely assumed by the bidder and the bonds continued to be outstanding on the same terms as they were prior to the merger. Dennis & McConnell suggest that where the exchange of security for a new class involves an "exchange premium" to induce security holders to participate in the exchange, then convertible bondholders would be able to participate in some of the merger gains while non-convertible bondholders could not.

A deficiency of the Asquith & Kim and Dennis & McConnell studies is their sample selection. In both

studies the selected samples included other types of consideration apart from equity offers. Since the wealth redistribution effect is most concerned with equity offers, non-equity bids could have introduced some noise into the data and reduced the ability of these studies to detect the wealth redistribution effect. Eger (1983) and Travlos (1987) address this problem by concentrating on pure equity exchange offers.

Eger (1983) used a sample of 39 share exchange mergers over the period 1958 to 1980. She found CAR for acquiring company bondholders of 0.905%¹¹ over the 51 day period (-30 to +20). Over the same interval target bondholders gain about 3%. Eger attributes the higher target bondholders' returns to the fact that these bonds had a higher risk rating and therefore stood to gain more from a reduction in risk.

Travlos (1987) examined the returns to non-convertible bonds of bidders in 28 mergers (16 cash offers & 12 equity offers) over the period 1972 to 1981. For the 11 day window centred on the bid announcement date (-5 to +5) bondholders in equity offers had a CAR of -1.99% ($t=-1.60$), while cash offers had a CAR of 1.47% ($t=1.94$). The mean difference between the CAR in cash and equity offers was statistically significant at the 0.10 level. This is inconsistent with the argument that wealth redistribution is more severe in equity offers.

While Eger (1983) found positive returns to the

¹¹t-statistics for CAR were not provided in the paper.

bidder's bondholders in equity offers, Travlos (1987) found negative returns. Although these results are inconsistent, the small sample sizes involved in these studies, limit our ability to draw general conclusions.

All the above studies have concentrated on the returns to the bondholders. The wealth redistribution theory has not been tested by examining the returns to shareholders (i.e, relating the returns to shareholders to the changes in risk resulting from the merger).

7.6. Other studies on the method of payment and shareholder wealth

Huang & Walkling (1987) and Franks et al (1988) tested whether the higher abnormal returns earned by target shareholders in cash offers could be caused by an underlying relationship between cash offers and some other bid characteristic.

Huang & Walkling (1987) argued that since most tender offers and hostile offers are financed by cash, while mergers and friendly offers are financed by equity exchanges, the higher abnormal returns associated with cash offers could be measuring the premium associated with either payment method, managerial resistance or form of acquisition (i.e, tender offer or merger). For a sample of 204 acquisitions announced between April 1977 and September 1982, they regressed the target's announcement period abnormal returns on, the method of payment, form of acquisition and the attitude of the target's management

(i.e, hostile or friendly).

In separate regressions (ie, each variable considered separately) they found that cash offers and tender offers had significantly higher returns than equity offers and mergers respectively. Resisted offers had insignificantly higher returns than friendly offers. However, the significant difference in abnormal returns between tender offers and mergers disappears when the payment method and the type of offer are included in the same multivariate regression. This suggested that the higher returns observed in tenders offers was partly attributable to the effects of the method of payment (in the sample 80% of tender offers used cash as the method of payment).

Franks et al (1988) performed a similar test to Huang & Walkling. For a sample of 1,555 US acquisitions announced over the period 1955 to 1984, they regressed the target's announcement period abnormal returns on, the method of payment, form of acquisition, the attitude of target managers and bid revision (i.e, whether the initial offer was revised or not). They found that managerial resistance and bid revision did not significantly influence returns to the target. However, contrary to Huang & Walkling, Franks et al found that returns to tender offers were still higher than in mergers after controlling for the method of payment.

A robust result established by Huang & Walkling and Franks et al is that the higher returns to cash offers is not related to either managerial resistance or the type of

takeover attempt (ie, tender offer or merger).

7.7. Conclusion

There is substantial empirical evidence that shareholders of both the acquiring and acquired firms gain higher returns in cash offers relative to equity offers (see Table 7.1 and 7.2). However most of this evidence has originated in the United States. There is very little UK based evidence on the impact of the payment currency on shareholder wealth. The only notable UK study is Franks et al (1988), but it mainly documents the returns to bidder and target shareholders given different methods of payment and provides no insights into why the method of payment influences shareholder wealth¹².

In this chapter, we discuss some of the theoretical reasons why returns in cash offers should be higher for the shareholders of both participating firms. The most commonly cited explanations include information asymmetry between managers and shareholders, compensation for capital gains tax and transfer of wealth from shareholders to bondholders. There is a very limited and inconclusive empirical literature that tests these explanations which have been advanced for the higher returns in cash offers.

Hayn (1989) and Franks et al (1988) examined the capital gains tax compensation hypothesis. While Hayn found

¹²While Franks et al (1988) show that capital gains tax cannot explain the higher returns in cash offers they do not test any of the other competing theories (ie, wealth transfer and information asymmetry) or offer any other explanation for their result that returns to bidder and target shareholders are higher in cash offers.

evidence that CGT affected the returns to target shareholders in the US, Franks et al found that in the UK CGT did not affect the returns to target shareholders.

With regard to the wealth transfer hypothesis, Eger (1983) found that bondholders in both the bidder and the target gained positive returns around the announcement of a merger, while Travlos (1987) found that bondholder returns around the announcement date were negative. There is no UK evidence on the wealth transfer hypothesis.

In the next chapter, we investigate why the payment method influences the returns to the shareholders of the participating firms. Although our study has similarities with some of the existing studies it has a much wider conceptual scope.

1) By using suitable proxies for information asymmetry between bidder managers and target shareholders, we test the role of information asymmetry in explaining the higher returns to cash offer. This issue has not been examined in the literature.

2) We test the wealth transfer hypothesis by regressing the returns to bidder and target shareholders on the post merger change in the risk of the combined firm. In this way we can examine whether changes in risk creates any wealth transfer between shareholders and bondholders. The relationship between changes in risk and the wealth of shareholders has not been examined in the literature. This is the first UK based study that tests the wealth transfer hypothesis.

3) We test the CGT compensation hypothesis by regressing the returns to bidder and target shareholders on the potential CGT realisable by target shareholders. Although there is some US evidence in this area (Hayn, 1989; Peterson & Peterson, 1991), there is no corresponding UK evidence. Differences between the US and UK tax environment (eg, availability of asset step-up in the US) implies that US evidence may not be broadly relevant to the UK.

CHAPTER 8

DETERMINANTS OF THE DIFFERENCE IN THE BID PREMIUM BETWEEN CASH OFFERS AND EQUITY OFFERS.

8.1. Introduction

There is significant evidence in the literature on takeovers that shareholders have different wealth experiences in different types of takeovers. A well documented result in the literature is that bidders and targets gain higher returns in cash offers than equity offers (see Table 7.1 and 7.2). However the source of this gain to cash offers is a research question which has not received much attention in the literature (see discussion in Chapter 7).

In this chapter we examine how the method of payment influences the returns to shareholders of both the bidder and the target. We test three of the most popular explanations that have been offered to explain the higher returns in cash offers: (i) information asymmetry between managers and shareholders (see Section 7.3), (ii) compensation for capital gains tax (see Section 7.4) and (iii) transfer of wealth from shareholders to bondholders (see Section 7.5). This research goes beyond a replication of earlier research which has examined the impact of the method of payment on shareholder wealth, in that we seek to provide evidence on the above theoretical arguments.

8.2. Methodology

We use standard event study methodology (Afshar et al, 1992; Brown and Warner, 1985) as described in Appendix 8.1. to estimate the impact of takeovers on shareholder wealth. The abnormal return measure (see Section 7.2) requires the specification of a control rate of return. Various alternatives are used to specify the control return¹:

1) Market model with a thin trading adjustment according to Dimson (1979¹): In this model, the control return is equal to the predicted value obtained from an ordinary least squares regression of the firm's return and the market's return over the 250 trading days ending 40 days before the announcement of the bid;

2) Market adjusted model (assuming zero intercept and beta equals 1 in the market model): In this model, the control return is equal to the return on the market index;

3) Mean adjusted model: In this model, the control return is equal to the average return of the firm over the 250 trading days ending 40 days before the announcement of the bid.

Abnormal returns are cumulated over the period 40 days before the announcement of the bid to 40 days after the bid announcement date. The choice of event period is designed to capture as much of the effects of the merger as possible without including too much non-merger noise in the data. A period like days -40 to +40 is considered adequate by most

¹There is a more detailed description of the control rate of return in Appendix 8.1.

studies (Weston et al, 1990: p.288).

In trying to explain why cash offers generate higher returns than equity offers we examine the interplay between capital gains tax, information asymmetry and the debt co-insurance effects. To evaluate the relative importance of all these factors in one single model, we estimate the following regression model for bidders and targets separately :-

$$\text{Shareholder wealth gain from the takeover} = f \left(\begin{matrix} \text{Capital gains tax,} \\ \text{Information asymmetry,} \\ \text{Debt co-insurance} \end{matrix} \right)$$

8.3. Data

The sample² is identical to the sample described in Section 4.5.1. In any multivariate regression, the nine methods of payment identified in Table 4.2 would require the use of eight dummy variables. This would be an unwieldy and cumbersome procedure, hence the nine methods of payment in Table 4.2 have been grouped into four larger groups as follows:

Cash offers: "All cash" and "Cash or debt";

Equity offers: "All equity";

Cash or equity offers: "Equity with a cash alternative (underwritten)" and "Equity with a cash alternative (not underwritten)";

²Due to error in the market index return data one observation was dropped from the analysis reducing the sample size to 504.

Cash & equity offers: "All cash or (equity plus cash)", "All equity or (equity plus cash)", "Equity and cash" and "others".

8.4. Wealth gains surrounding the bid announcement

In this section we report the effects of acquisition announcements on the returns to bidder and target shareholders.

8.4.1. Returns to target shareholders

Table 8.1 reports the wealth gains to the target over different periods centred on the announcement date. The results for targets are similar irrespective of the method used in specifying the control rate of return. Over the whole of the event period (-40 to +40 days) targets have significant wealth gains of about 28% irrespective of the estimation model used, implying that the results are robust to model specification. Our results are consistent with those found in other studies for UK targets. Over comparable event periods, Franks and Harris (1989) reported abnormal returns to the target of 25.8%, Limmack (1991) reported returns of 31.38%, while Higson and Elliot (1993) reported returns of 21.70%.

Over the pre-bid period (-40 to -1 days), targets have significant positive abnormal returns of about 11%. Positive returns in the pre-bid period suggest that the market is somehow able to anticipate the bid. Shih & Suk (1992) investigated whether the stock price runup in tender

Table 8.1.

Cumulative abnormal returns to targets over different windows surrounding bid announcements.

Sample size = 504.

Windows (Days)	Dimson Model	Market Adjusted	Mean Adjusted
-40 to +40	0.286*** a=32.38 b=41.25 c=87.30	0.288*** a=33.09 b=42.76 c=87.10	0.293*** a=31.11 b=41.52 c=85.91
-40 to -1	0.108*** a=17.35 b=22.35 c=72.81	0.111*** a=18.18 b=23.62 c=73.21	0.115*** a=17.29 b=23.13 c=72.82
0	0.137*** a=139.76 b=172.45 c=83.93	0.138*** a=142.47 b=177.24 c=83.73	0.138*** a=131.25 b=169.93 c=81.94
+1 to +40	0.041*** a=6.71 b=9.21 c=58.73	0.039*** a=6.47 b=9.32 c=58.53	0.041*** a=6.31 b=9.21 c=59.13

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

offers was a reflection of insider trading. They found that the price runup for firms displaying insider net buying activity was not different from those for firms displaying insider net selling activity.

Niendorf & Huffman (1992) developed a Logit model to predict the probability that a firm would be the target of a takeover. The acquisition probabilities estimated by the model were then used to explain the price reaction around the announcement date. They found that the probability of a firm being acquired estimated by their Logit model was

negatively correlated to the abnormal returns observed in the announcement period. This suggests that the market is able to impound publicly available information about the probability of a firm being acquired into the share price. The results from Niendorf & Huffman suggests that the positive pre-bid abnormal returns are partly a reflection of the market correctly predicting takeover targets. Similarly in a study of UK targets, Holland & Hodgkinson (1994) found that abnormal returns in the pre bid period were related to the pre-announcement disclosure of bid related news items.

In the post bid period, targets earn positive abnormal returns of about 4%. Statistically significant returns in the post bid period could be explained by the flow of new information in the post bid period which resolves any uncertainty that the bid would be completed.

Figures 8.1-8.3 show the daily abnormal returns to the target. Under all three models specifying different control rates of return, we see that most of the valuation effect of the bid occurs on the announcement date. The abnormal return to the target shareholders on the announcement date is around 14%.

Figure 8.4 shows the cumulative daily abnormal returns to the target. Consistent with the evidence of pre-announcement information leak in Table 8.1, the cumulative abnormal returns begin to rise about 25 days before the announcement date. The cumulative abnormal returns continue to rise until about 25 days after the announcement date.

Figure 8.1.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson model.

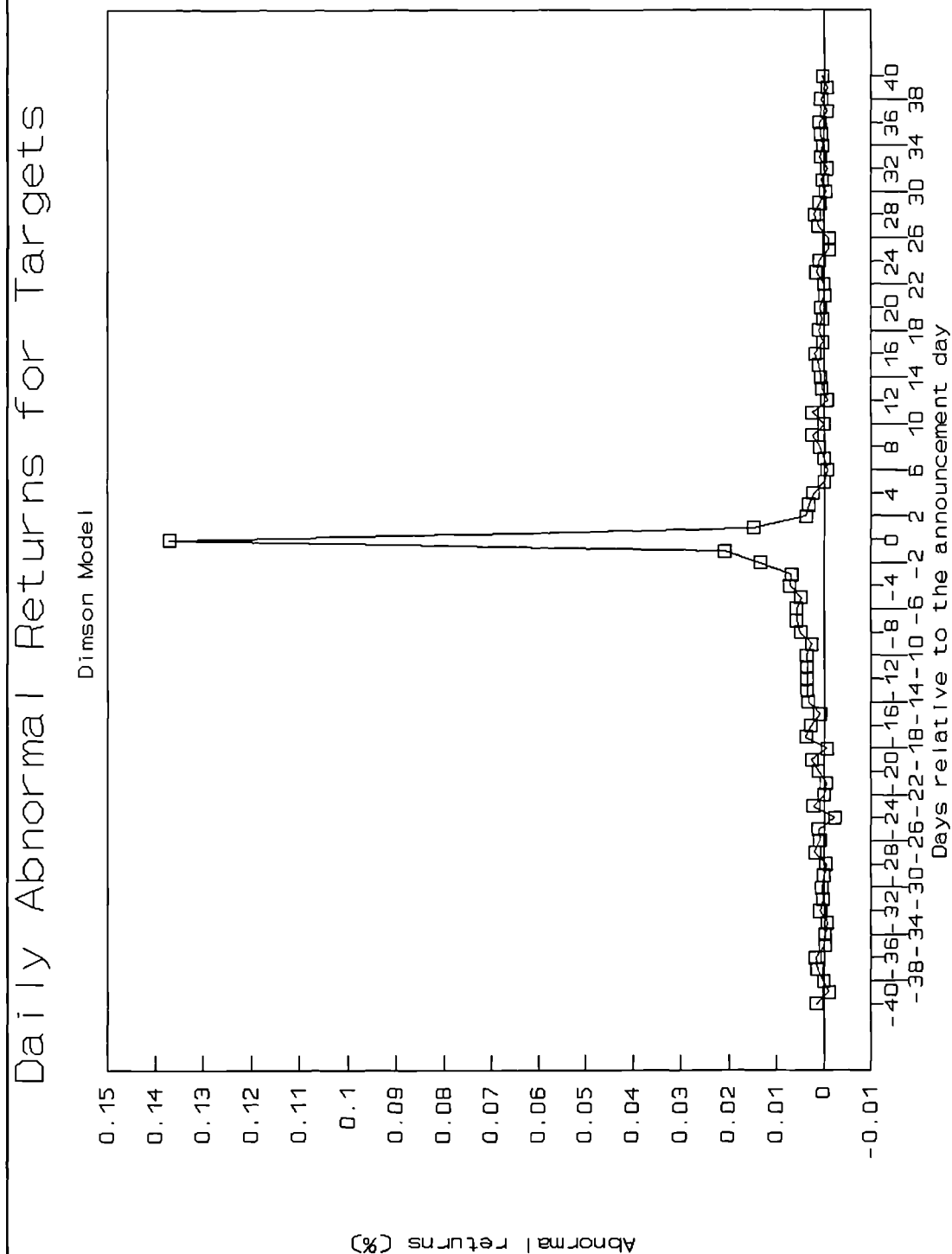


Figure 8.2.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Market Adjusted model.

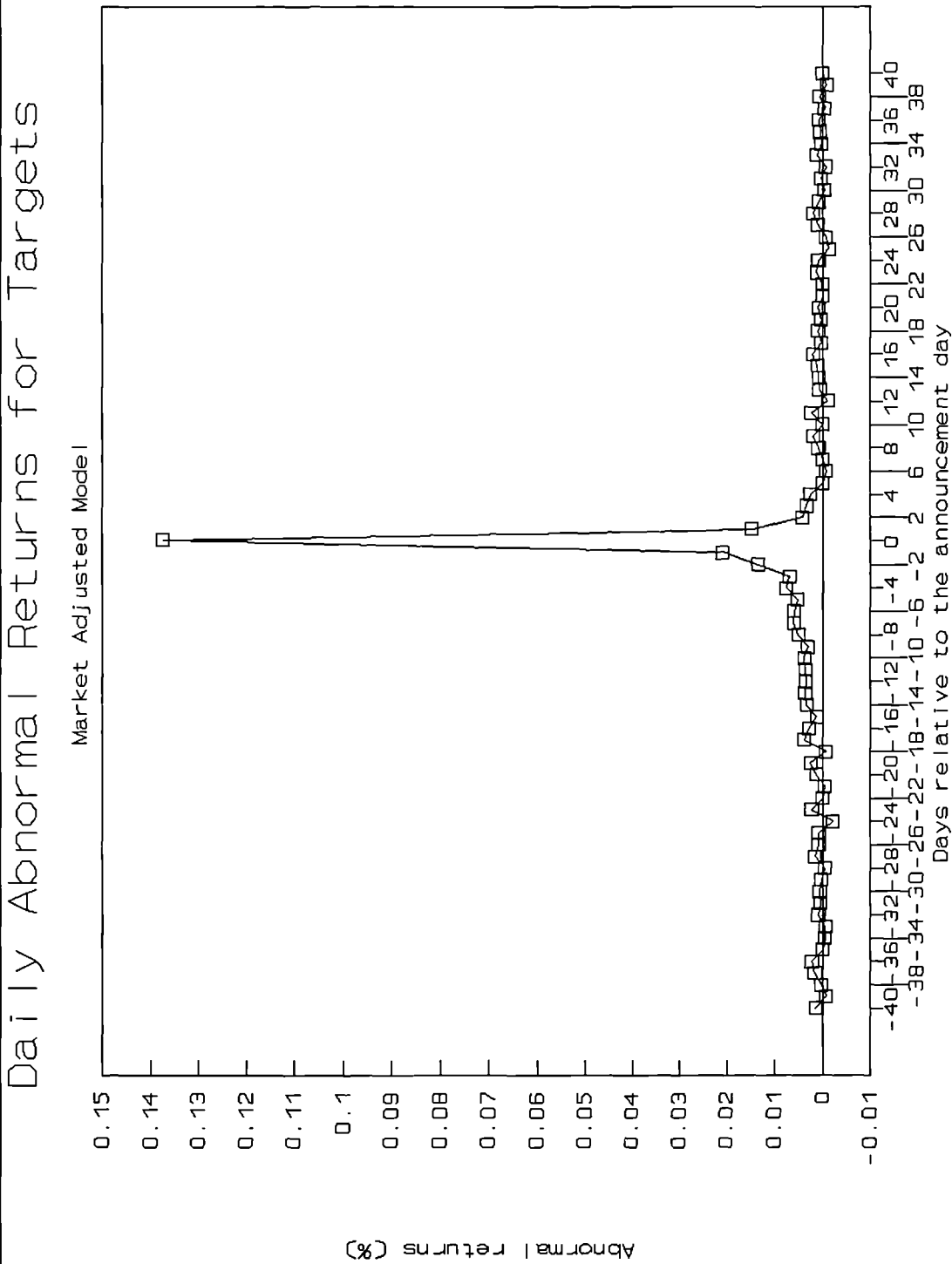


Figure 8.3.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Mean Adjusted model.

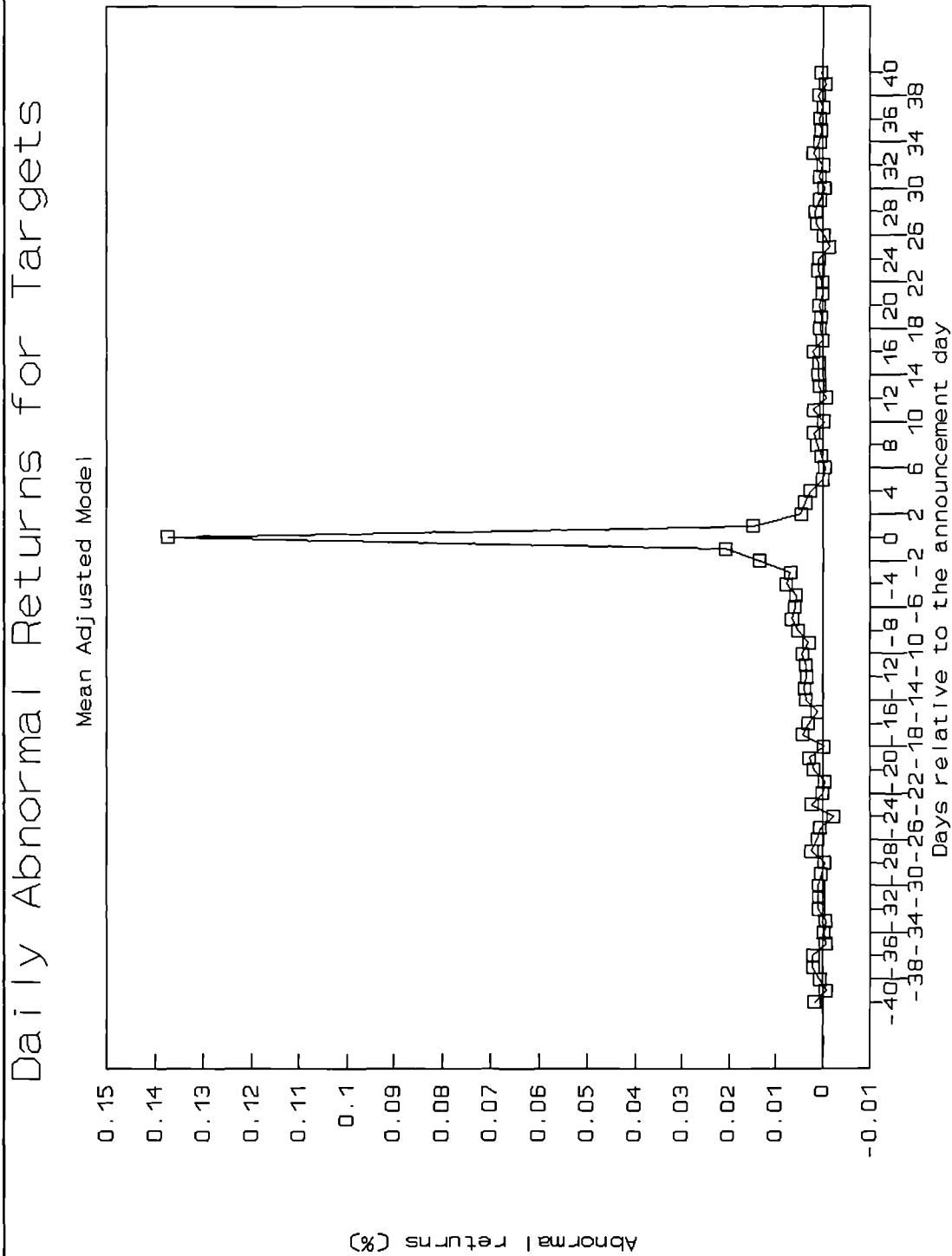
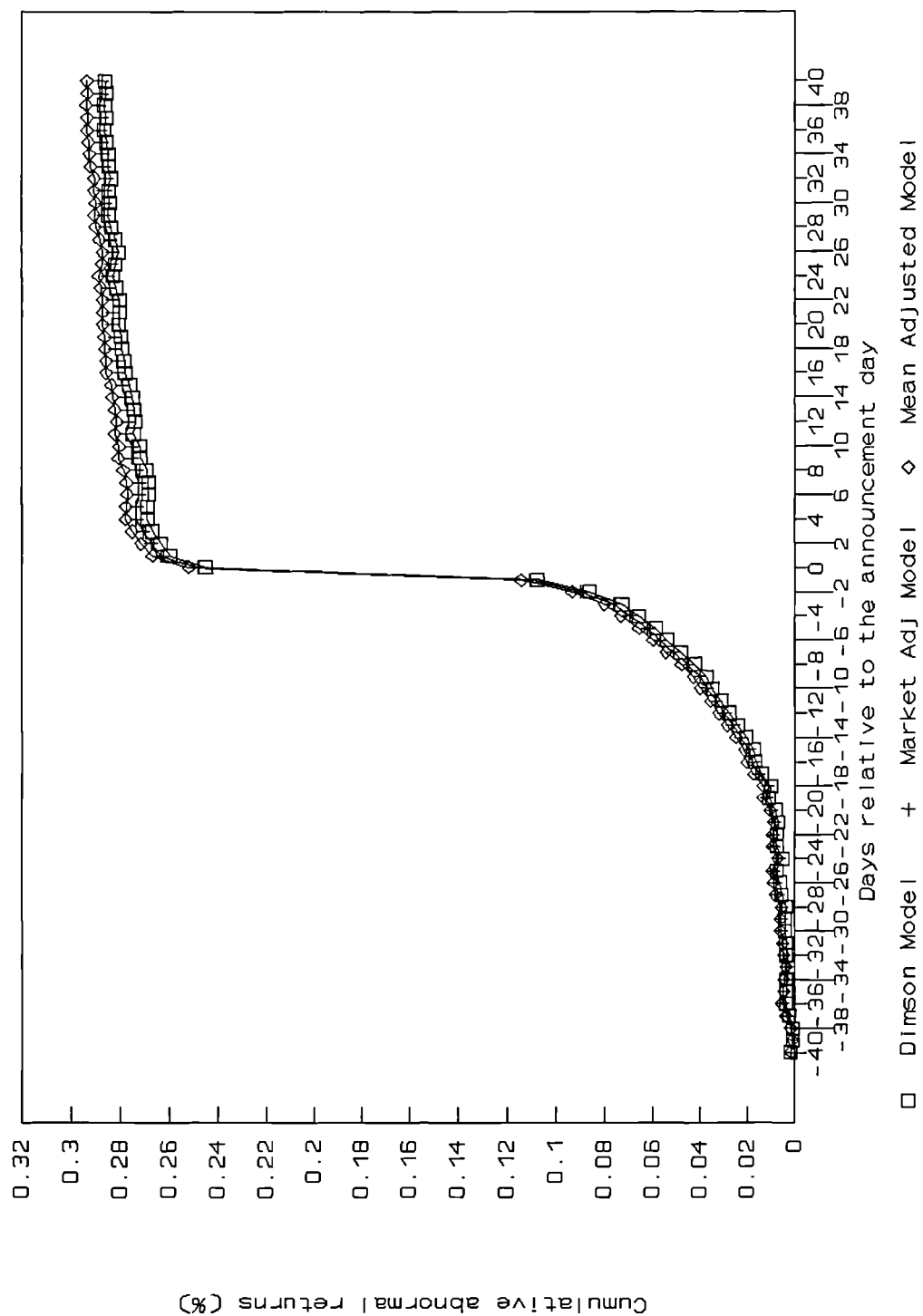


Figure 8.4.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson, Market Adjusted and Mean Adjusted models.

Cumulative Abnormal Returns for Targets



This shows that the impact of the bid on the target's share price is concentrated around the period -25 to +25 days. With a window of -40 to +40 days we have captured almost all of the wealth impact of bids on target shareholders.

8.4.2. Returns to target shareholders by the method of payment

Table 8.2 shows the abnormal returns to targets over days -40 to +40 partitioned by the method of payment.

Table 8.2.
Cumulative abnormal returns to targets over the period -40 to +40 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	0.356*** a=15.12 b=19.75 c=91.57	0.366*** a=16.14 b=20.74 c=93.98	0.375*** a=16.09 b=20.16 c=93.98
Cash or Equity	222	0.297*** a=21.68 b=28.71 c=86.94	0.297*** a=21.96 b=29.65 c=86.04	0.305*** a=21.21 b=29.20 c=83.78
Cash and Equity	111	0.272*** a=15.63 b=20.01 c=88.29	0.277*** a=16.46 b=20.78 c=89.19	0.271*** a=14.97 b=19.31 c=90.09
Pure Equity	88	0.211*** a=8.32 b=11.48 c=82.96	0.202*** a=7.99 b=11.76 c=80.68	0.214*** a=8.09 b=11.72 c=78.41
F-statistic.	504	3.49**	4.42***	4.09***

Notes:
 ***, **, * Significant at the 1%, 5%, 10% levels respectively.
 a = t-statistic under the dependence assumption.
 b = t-statistic under the independence assumption.
 c = percentage of observations that are positive.

We find that targets in cash offers earn abnormal returns

of about 35% while targets in equity offers earn returns of about 21%. This is consistent with the results in Franks et al (1988) reported in Table 7.1. Additionally our results of about 30% and 27% for "cash or equity" and "cash & equity" offers respectively are consistent with Franks et al's results of 28.4% for "cash or equity" offers and 27.1% for "cash & equity" offers. The F-statistic for the difference in group means shows that there are significant differences in the abnormal returns to the different methods of payment. However, Table 8.2 does not tell us which group means are statistically different from one another.

In Table 8.3 we perform a pair wise comparison of the average abnormal returns to the target shareholders for each of the different methods of payment. The returns to equity offers and cash & equity offers are significantly lower than the returns to cash offers.

"Cash or equity" offers reduce the detrimental tax consequences of cash offers (see Section 2.5 and 7.4.1). If the CGT compensation hypothesis is correct, then the returns to cash offers should be higher than the returns to "cash or equity" offers. The difference in returns between cash offers and cash or equity offers is significant at the 10% level for the Market Adjusted Model and the Mean Adjusted Model, but insignificant under the Dimson Model. As this result appears to be sensitive to the choice of control model and, where relevant, is only significant at the 10% level, we cannot reject the null hypothesis that

Table 8.3.

Pairwise comparison of the target's abnormal return over the period -40 to +40 days for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.54	1.95*	3.33***
Cash or Equity		0.70	2.25**
Cash & Equity			1.40

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.77*	2.10**	3.76***
Cash or Equity		0.56	2.45**
Cash & Equity			1.81*

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.71*	2.43**	3.59***
Cash or Equity		0.90	2.24**
Cash & Equity			1.35

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

there is no difference in the returns between cash offers and "cash or equity" offers. This suggests that while there may be a CGT compensating premium in cash offers, it is not sufficient to explain the higher returns observed in cash offers.

Figures 8.5-8.7 partition the target's cumulative abnormal returns according to the method of payment. Consistent with Table 8.2, these show that the target bid premia are distinctly higher in cash offers than in equity offers. Offers which provide the vendors with the opportunity to accept either cash or equity have lower returns than cash offers, although as Table 8.3 shows the statistical significance of the difference is weak. Abnormal returns to cash & equity offers appear to be an average of the results for pure cash and pure equity offers.

Figures 8.5-8.7 show that the method of payment does not have any effect on the returns to target shareholders in the pre announcement period. This is understandable, since we have no reason to believe that investors can anticipate the method of payment prior to the announcement of the terms of the offer. Further evidence of the absence of any method of payment effect in the pre announcement abnormal returns to target is provided in Tables 8.4 and 8.5, where we examine whether information leak in the pre announcement period (-40 to -1 days) is related to the method of payment. The F-statistic in Table 8.4 shows that there are no significant differences in the average returns

Figure 8.5.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson model. Sample size:- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.

CAR for Targets by Method of Payment

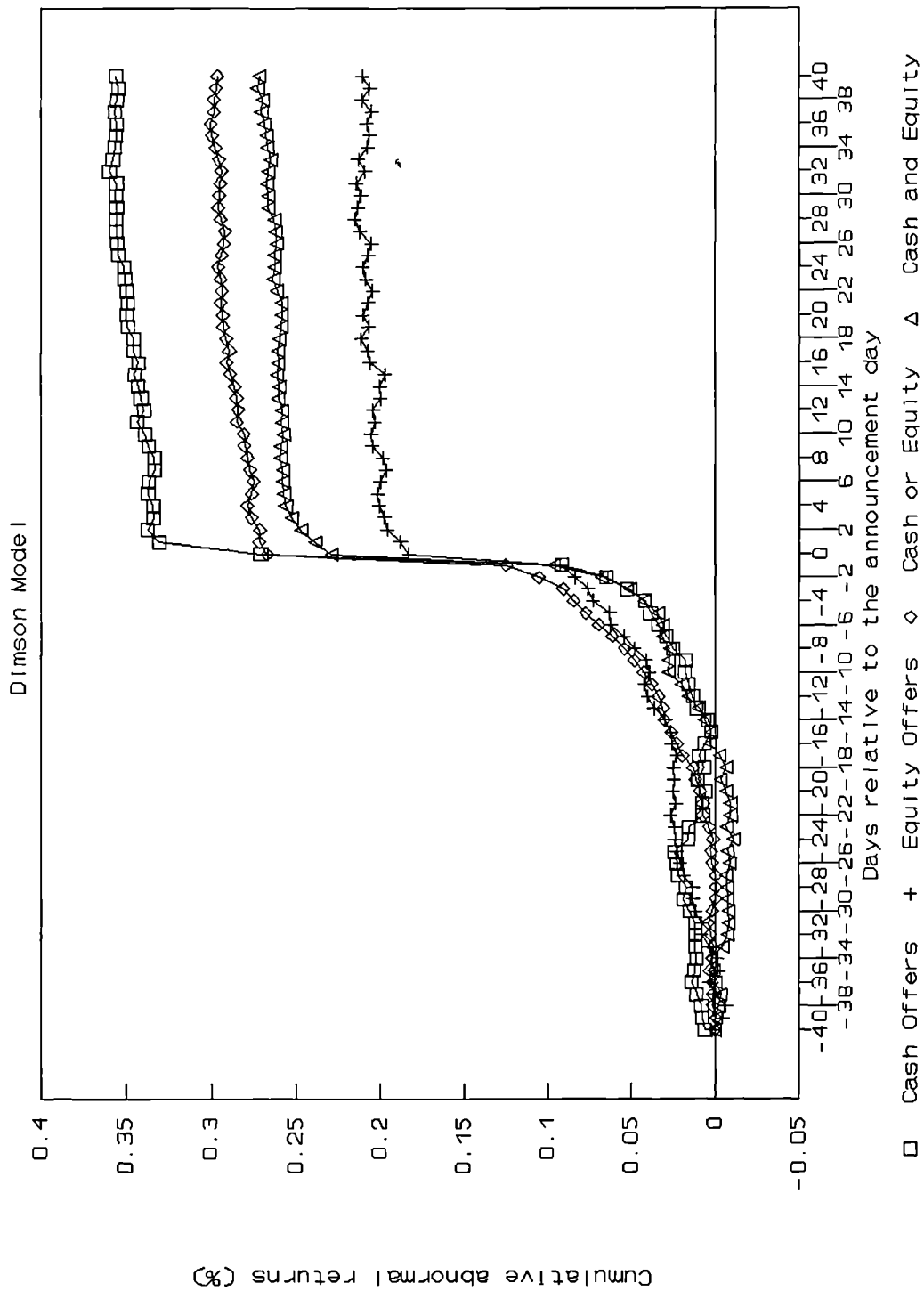


Figure 8.6.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Market Adjusted model. Sample size:- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.

CAR for Targets by Method of Payment

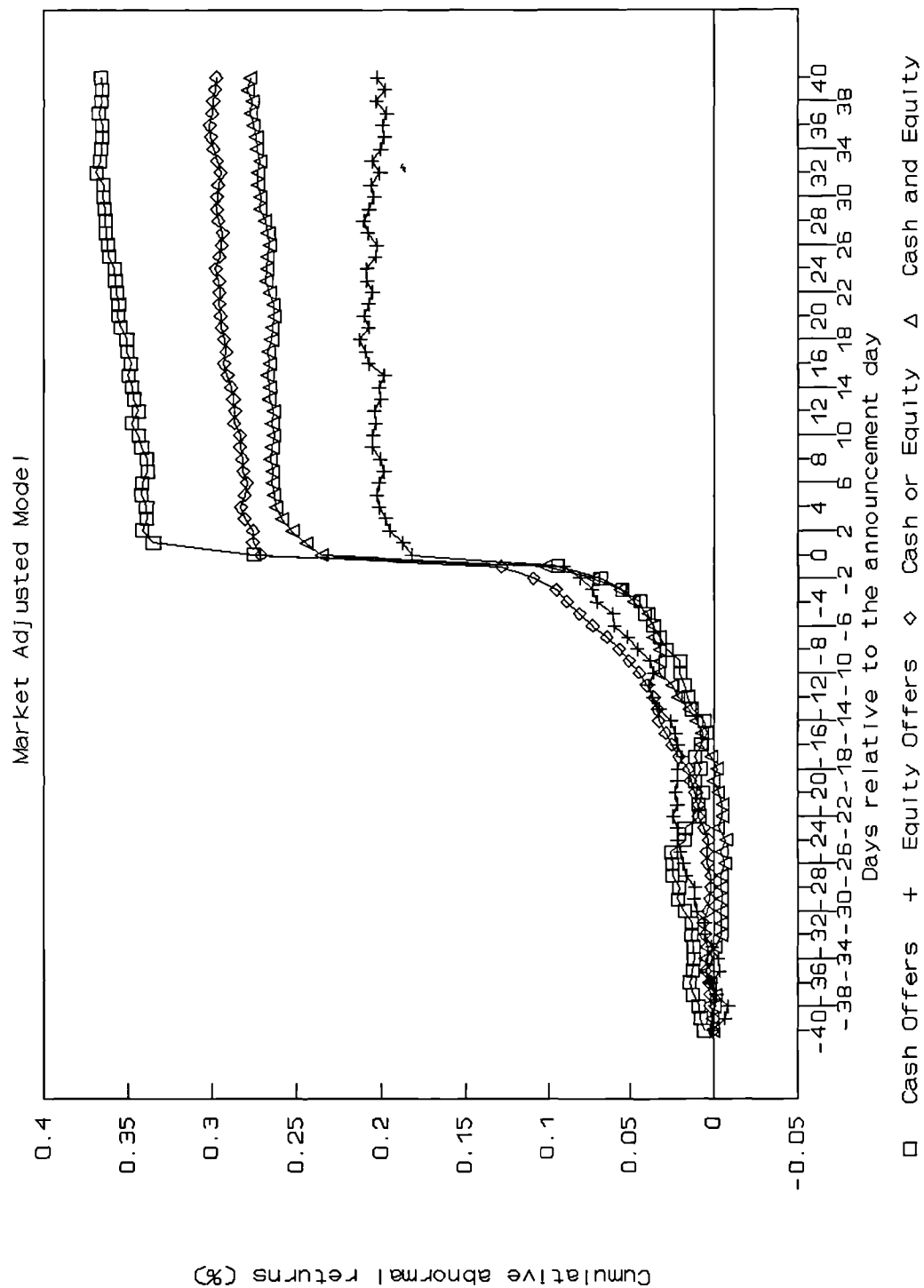


Figure 8.7.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Mean Adjusted model. Sample size:- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.

CAR for Targets by Method of Payment

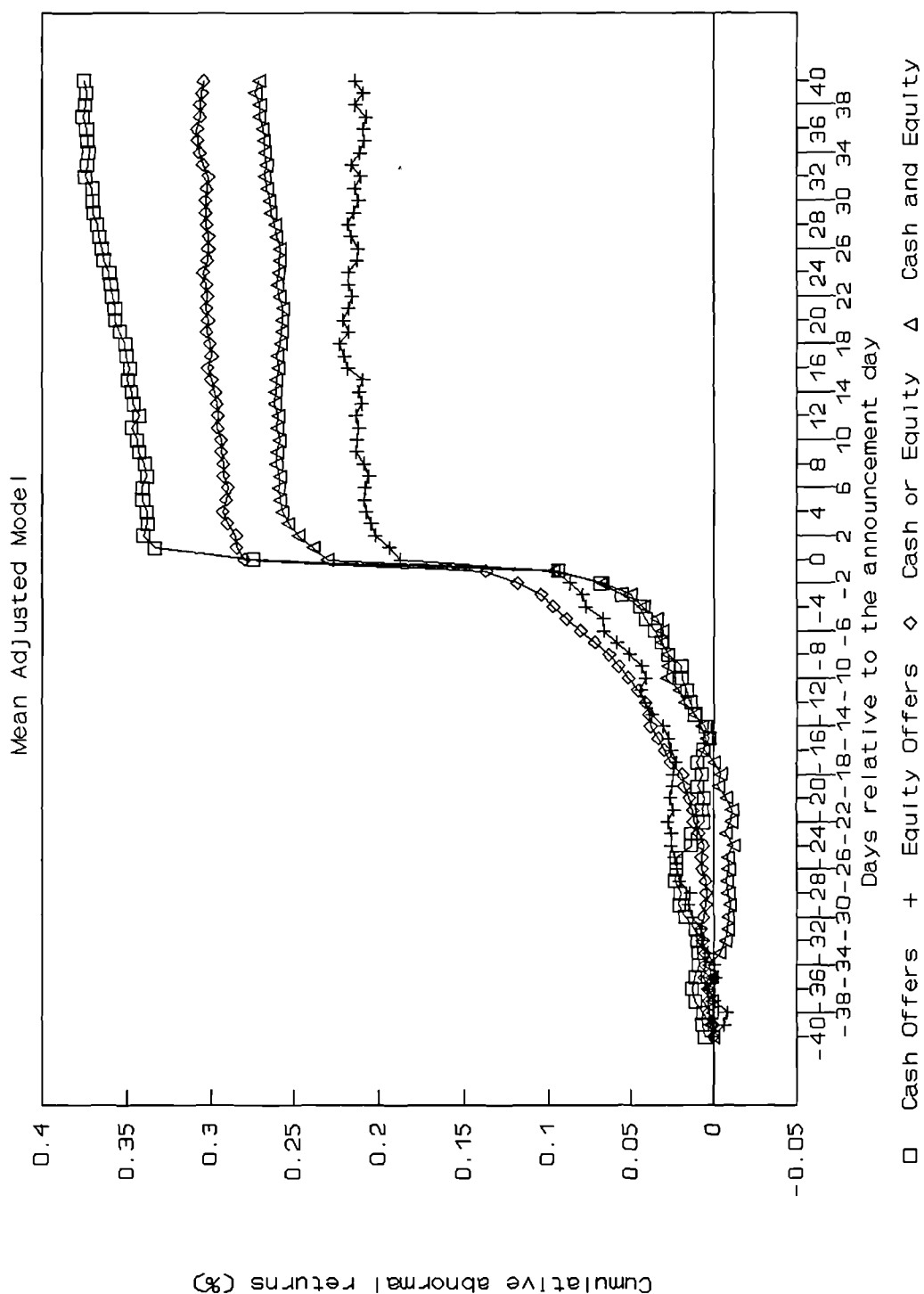


Table 8.4.

Cumulative abnormal returns to targets over the period -40 to -1 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	0.092*** a=5.53 b=7.59 c=67.47	0.095*** a=5.96 b=7.94 c=68.67	0.095*** a=5.80 b=7.56 c=68.68
Cash or Equity	222	0.125*** a=12.99 b=17.23 c=73.87	0.129*** a=13.57 b=18.36 c=73.42	0.137*** a=13.59 b=18.65 c=72.97
Cash and Equity	111	0.097*** a=7.94 b=11.10 c=75.66	0.103*** a=8.66 b=11.66 c=76.58	0.097*** a=7.64 b=10.59 c=75.68
Pure Equity	88	0.093*** a=5.23 b=6.29 c=71.59	0.091*** a=5.12 b=6.56 c=72.73	0.097*** a=5.22 b=6.50 c=72.73
F-statistic.	504	1.11	0.92	1.43

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

to the different methods of payment in the pre announcement period. The t-statistic in Table 8.5 also shows that the abnormal returns to the different methods of payment in the pre bid period are comparable.

In Tables 8.6 and 8.7, we examine whether the abnormal returns to targets in the post announcement period (+1 to +40 days) is affected by the method of payment. Both the F-statistic in Table 8.6 and the t-statistic in Table 8.7, show that there is a method of payment effect in the immediate post announcement period, with cash offers

Table 8.5.

Pairwise comparison of the target's abnormal return over the period -40 to -1 days for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.40	-0.17	-0.06
Cash or Equity		0.98	1.31
Cash & Equity			0.11

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.43	-0.25	0.14
Cash or Equity		0.97	1.59
Cash & Equity			0.36

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.68*	-0.07	-0.07
Cash or Equity		1.32	1.60
Cash & Equity			0.01

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

Table 8.6.

Cumulative abnormal returns to targets over the period +1 to +40 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	0.085*** a=5.20 b=6.72 c=61.45	0.090*** a=5.75 b=7.40 c=62.65	0.101*** a=6.21 b=7.81 c=69.88
Cash or Equity	222	0.029*** a=3.09 b=4.84 c=57.21	0.026*** a=2.73 b=4.58 c=57.21	0.025*** a=2.50 b=4.31 c=58.11
Cash and Equity	111	0.042*** a=3.51 b=4.55 c=60.36	0.042*** a=3.60 b=4.64 c=57.66	0.041*** a=3.26 b=4.16 c=54.96
Pure Equity	88	0.028*** a=1.58 b=2.72 c=57.96	0.020*** a=1.15 b=2.64 c=59.09	0.027*** a=1.46 b=2.94 c=56.82
F-statistic.	504	2.19*	2.87**	3.36**

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

earning significantly higher abnormal returns than all other methods of payment.

8.4.3. Returns to bidder shareholders

Table 8.8 shows the abnormal returns to bidder shareholder. Bidders suffered significant wealth losses of about 4%. The negative wealth loss to bidders is consistent with some of the extant results. Limmack and McGregor (1992) reported returns to the bidder of -3.43% (t=2.49) and Higson and Elliot (1993) reported bidder returns of -

Table 8.7.

Pairwise comparison of the target's abnormal return over the period +1 to +40 days by the method of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	2.27**	1.70*	1.90*
Cash or Equity		-0.77	0.06
Cash & Equity			-0.62

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	2.60***	1.93*	2.19**
Cash or Equity		-0.97	0.22
Cash & Equity			0.85

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	2.91***	2.42**	2.28**
Cash or Equity		-0.90	0.07
Cash & Equity			0.53

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

Table 8.8.

Cumulative abnormal returns to bidders over different windows surrounding bid announcements.

Sample size is 504.

Window (Days)	Dimson Model	Market Adjusted	Mean Adjusted
-40 to +40	-0.038*** a=-4.42 b=-4.38 c=43.65	-0.035*** a=-4.16 b=-4.01 c=42.06	-0.035*** a=-3.82 b=-3.65 c=46.82
-40 to -1	0.008 a=1.32 b=2.18 c=49.80	0.010* a=1.75 b=2.50 c=50.00	0.014** a=2.09 b=2.89 c=54.96
0	-0.012*** a=-12.30 b=-15.47 c=32.54	-0.012*** a=-12.43 b=-15.94 c=32.94	-0.012*** a=-11.39 b=-14.10 c=32.14
+1 to +40	-0.034*** a=-5.74 b=-6.05 c=40.28	-0.034*** a=-5.78 b=-5.76 c=40.87	-0.037*** a=-5.80 b=-5.94 c=43.65

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

5.30% (Z=2.70). But these results are inconsistent with Franks and Harris (1989) who report small significant positive gains to bidders of 2.4% (t=2.28) and Limmack (1991) who found bidder abnormal returns of -0.20% (t=0.22).

The size of the wealth loss suffered by bidders is quite large over a relatively short event period. Most of these losses occur in the immediate post announcement period. In the post announcement period (+1 to +40 days) Bidders suffered losses of -3.4%, which is virtually

equivalent to the loss for the whole announcement period. These negative post announcement abnormal returns are puzzling. One possible explanation is that the negative returns are caused by non-stationarity in the systematic risk of the bidder. Franks et al (1991) provide some evidence that these negative returns are due to errors in the portfolio bench marks used to adjust for risk³. The Franks et al result shows that the measurement of the returns to the bidder can be sensitive to the model used to control for risk. Since we are using a relatively short event window and the result of negative performance for bidders in the immediate post announcement period is consistent across all three of our control models it is doubtful whether our result can be attributed to errors in the control bench mark.

Given the relatively short period of time over which these negative post announcement returns have been observed, variables such as the method of payment which convey new information to the market could be significant in explaining these negative returns (see Sections 2.4.2 and 7.3.1).

Figures 8.8-8.10 show the daily abnormal returns to the bidder with the alternative models. The daily returns to the bidder are more volatile than target daily returns

³In evaluating the post merger share price performance of bidder, Franks et al (1991) calculated the control rates of return using both a single factor bench mark (i.e, the market index) and multi factor bench marks derived from the portfolio evaluation literature. They found that abnormal returns in the post merger period were sensitive to the number of factors included in the bench mark portfolio.

(see Figures 8.1-8.3). This is consistent with the prevailing view in the literature that it is more difficult to estimate the wealth effects of a merger for bidders than for targets (Jensen & Ruback, 1983).

Prior capitalisation of the merger gains in the bidder's share price could affect our ability to detect any merger benefits to bidders around the merger announcement date. Usually targets can only be acquired once, whereas bidders can engage in a prolonged acquisition programme. If the expected value of the acquisition programme is capitalised in the bidder's share price when the acquisition programme is announced, then the gains measured around the merger announcement date would only partially reflect the true merger gains. Schipper & Thompson (1983) found some evidence that merger gains were capitalised in the bidder's share price at the start of an acquisition programme.

The larger size of bidders than targets also hampers our ability to measure the wealth effects of the merger on the bidder. Bidders in our sample are on average 30 times larger than targets⁴ hence the same £ gains for bidders and targets are translated into smaller abnormal returns for bidders. The smaller returns to bidders caused by the larger size of the bidders would limit the significance of any wealth effects measured around the merger announcement date (Asquith, Bruner & Mullins, 1983; Bruner, 1988).

Figure 8.11 shows the cumulative daily abnormal

⁴See the variable RELSIZE in Table 4.3 (Chapter 4).

Figure 8.8.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson model.

Daily Abnormal Returns for Bidders

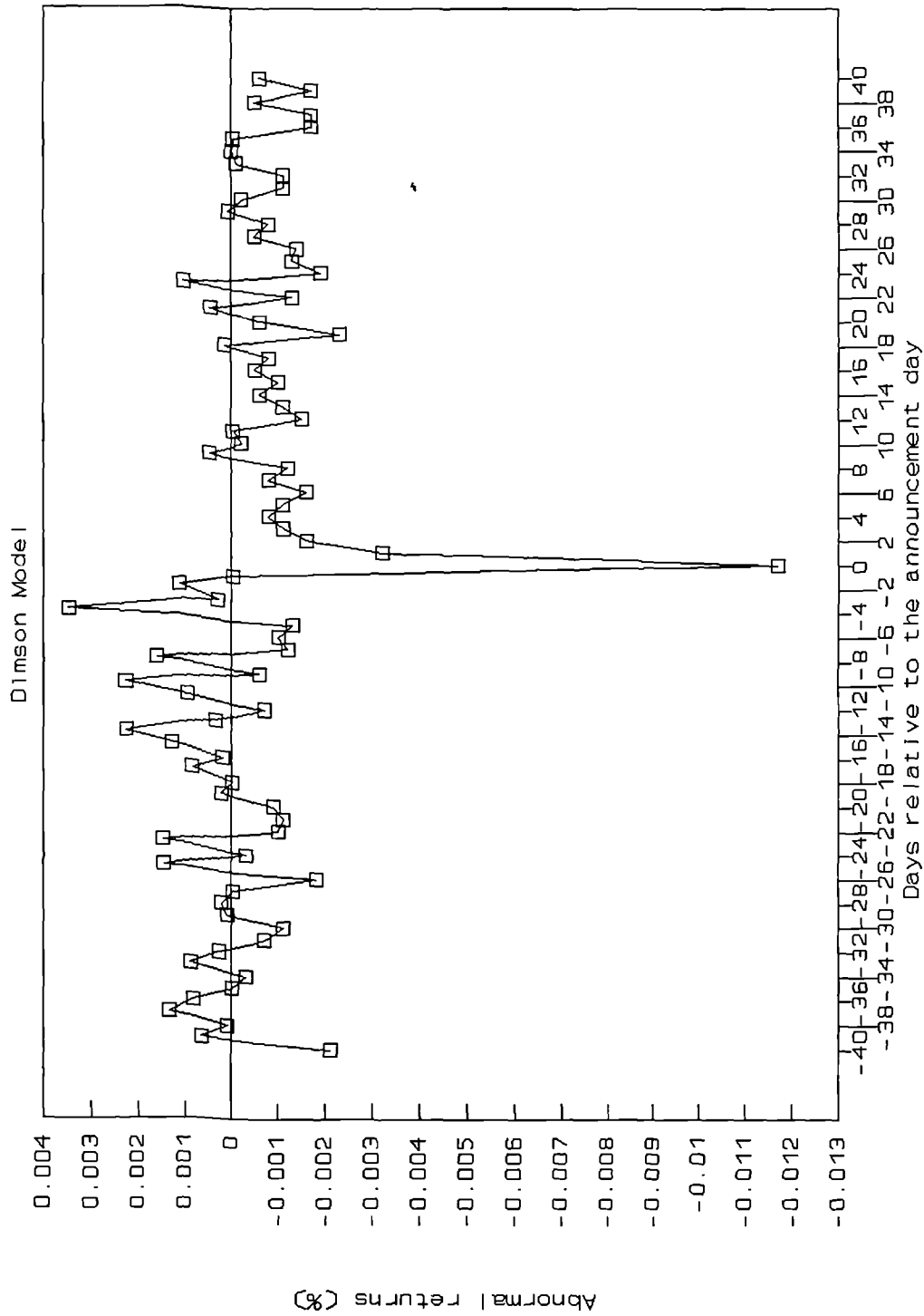


Figure 8.9.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Market Adjusted model.

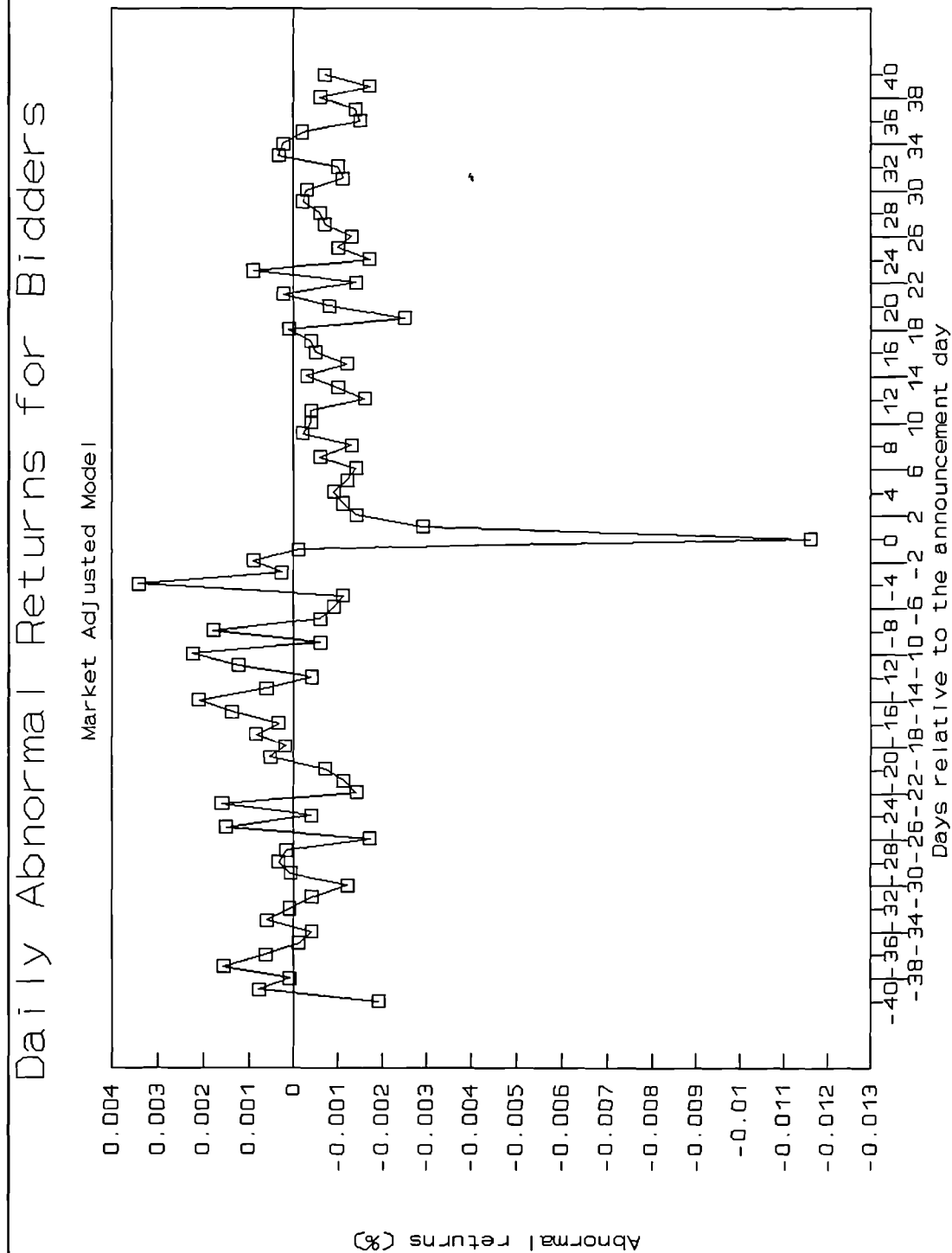


Figure 8.10.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Mean Adjusted model.

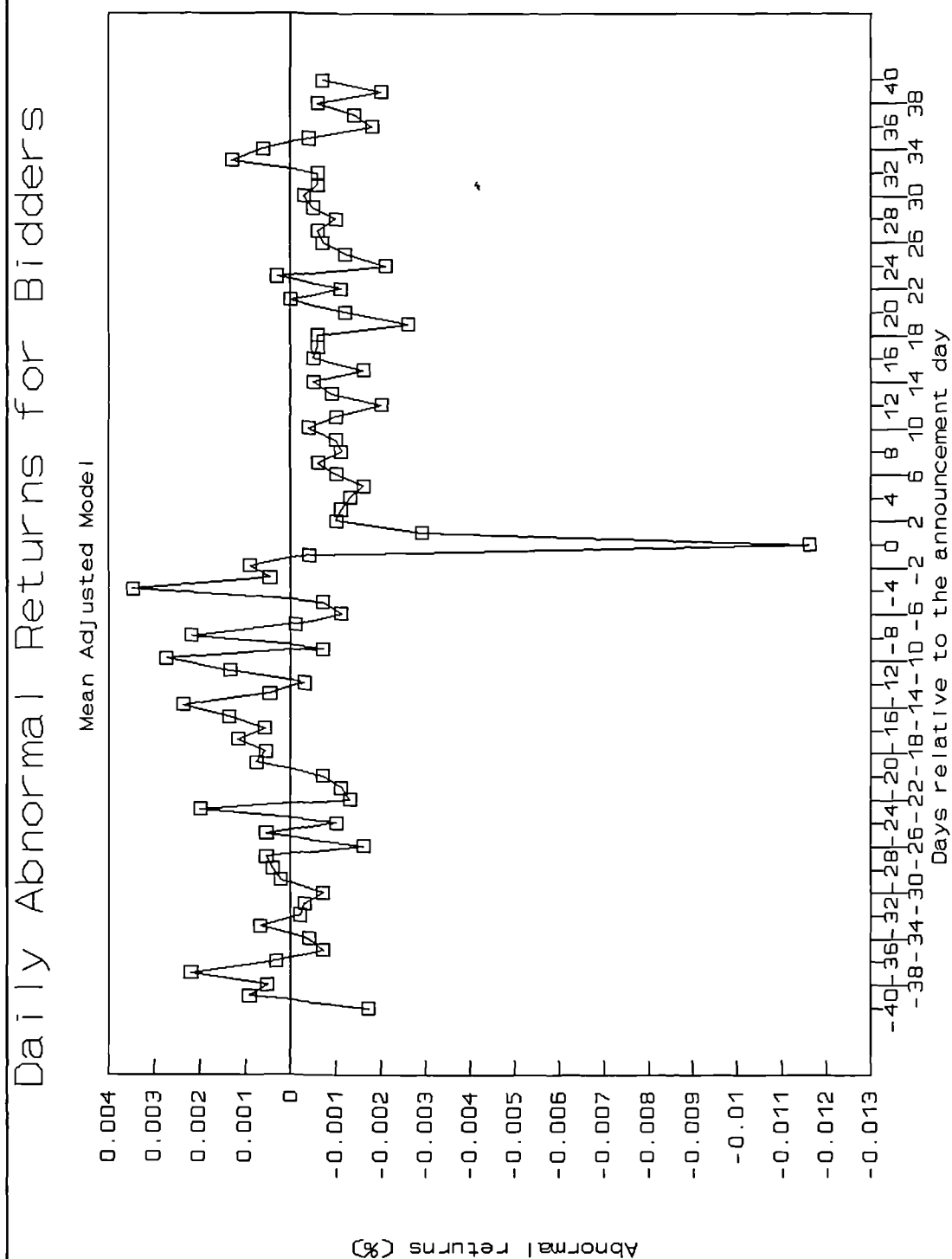
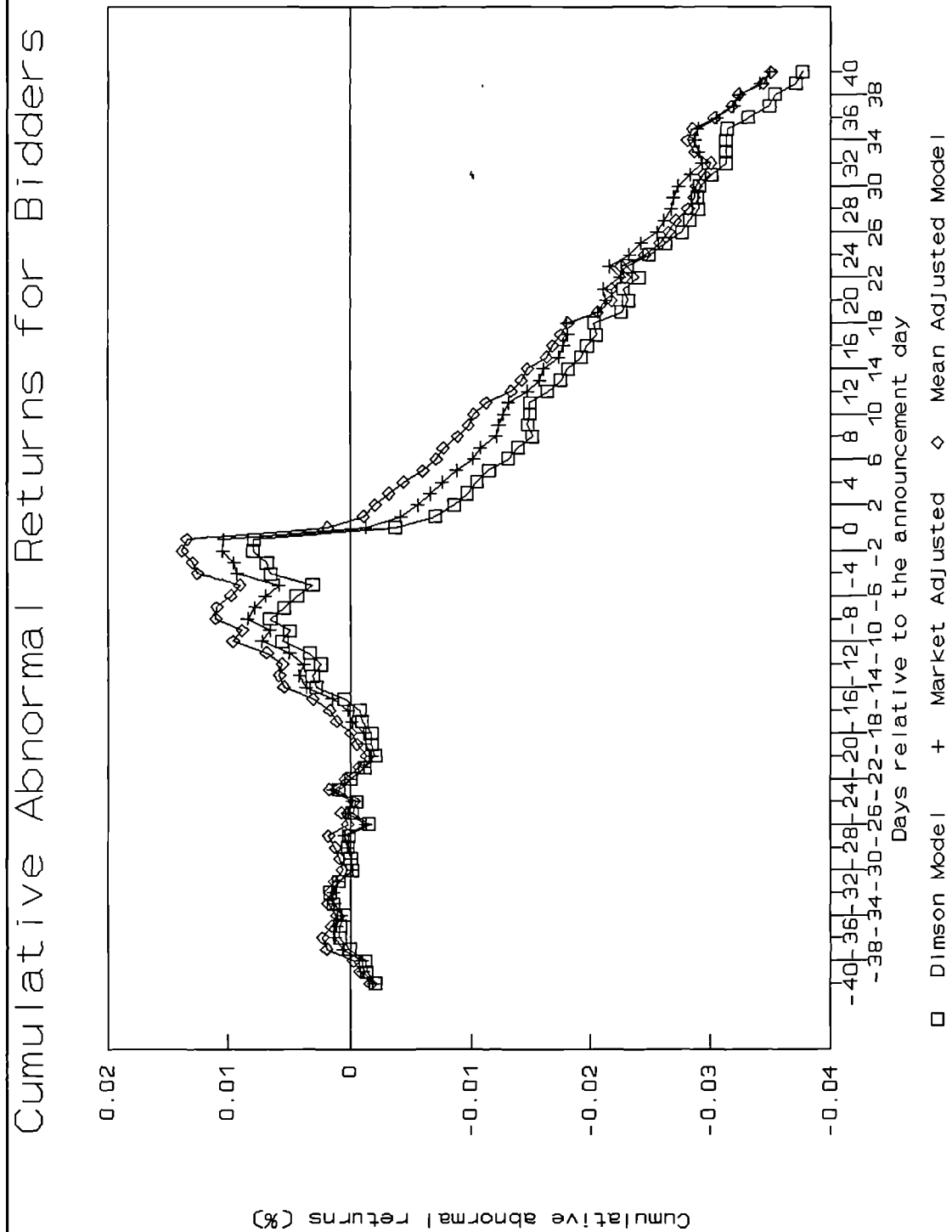


Figure 8.11.

Note: Sample size is 504. Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson, Market Adjusted and Mean Adjusted models.



returns to the bidder. These are consistently positive about 15 days before the announcement of the bid. This result is in accordance with the extant evidence that bidders generally tend to experience a positive run up in their share price in the period immediately preceding a bid (Mandelker, 1974; Langetieg, 1979; Asquith, 1983). Assuming that bidders wish to capitalise on the recent strong performance of their shares, it is still doubtful whether a positive abnormal return of 1% over the period -40 to -1 days would be sufficient to induce a bidder to undertake an acquisition.

8.4.4. Returns to bidder shareholders by the method of payment

Table 8.9 shows the abnormal returns to the bidders partitioned by the method of payment. The returns of about 1% to cash bidders and about -2.5% to equity bidders is consistent with the results in Franks et al (1988) and Limmack & McGregor (1992). Franks et al reported returns of 0.7% ($t=0.75$) to cash bidders and -1.1% ($t=-0.95$) to equity bidders, while Limmack & McGregor reported returns of -0.15% ($t=0.09$) to cash bidders and -2.96 ($t=1.43$) to equity bidders. The most striking result in Table 8.9 is the return to cash & equity offers of about -6.5%. Limmack & McGregor found a similar result of -6.46% ($t=2.95$) return to cash & equity offers. Franks et al reported insignificant gains of 0.3% ($t=0.23$) to cash & equity offers. Given that cash bidders experience insignificant

Table 8.9

Cumulative abnormal returns to bidders over the period -40 to +40 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	0.005 a=0.24 b=-0.07 c=54.22	-0.001 a=-0.03 b=-0.025 c=48.19	0.010 a=0.45 b=0.77 c=55.42
Cash or Equity	222	-0.040** a=-2.98 b=-2.57 c=43.24	-0.037** a=-2.76 b=-1.98 c=41.89	-0.037** a=-2.52 b=-1.56 c=47.30
Cash and Equity	111	-0.065*** a=-4.07 b=-4.28 c=36.04	-0.065*** a=-4.24 b=-4.59 c=34.23	-0.074*** a=-4.36 b=-4.95 c=35.14
Pure Equity	88	-0.037* a=-1.60 b=-1.53 c=44.32	-0.025 a=-1.05 b=-1.05 c=46.59	-0.023 a=-0.89 b=-0.88 c=52.27
F-statistic.	504	1.98*	1.61	1.79

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

positive returns and equity bidders experience insignificant negative returns, the finding of significant losses to cash & equity offers is rather puzzling. Further analysis below suggests that these losses to cash & equity offers results from the poor performance of bidders offering cash & equity in the pre announcement period.

In Table 8.10 we perform a pair wise test of difference in average abnormal returns to bidders using different methods of payment. The only uniformly significant difference is that between cash offers and cash

Table 8.10

Pairwise comparison of the bidder's abnormal return over the period -40 to +40 days for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.97*	2.58**	1.37
Cash or Equity		1.08	-0.12
Cash & Equity			-0.93

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.52	2.55**	0.79
Cash or Equity		1.23	-0.44
Cash & Equity			-1.38

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.52	2.69***	0.88
Cash or Equity		1.35	-0.39
Cash & Equity			-1.46

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

& equity offers. This is not consistent with the argument that the use of equity will lead to a downward revision in the bidder's share price. If the market reacts unfavourably to the use of equity, we would expect equity bidders to show the largest losses. Contrary to this we find that there is no significant difference in returns between equity bidders and cash bidders, while bidders offering a mixture of cash & equity suffer the largest losses.

Figures 8.12-8.14 partition the cumulative abnormal returns to bidders according to the method of payment. It is clear from these graphs that there is a method of payment effect in the negative returns observed for the post announcement period. There is a marked contrast in the pre and post announcement abnormal returns behaviour of equity and cash bids. In the pre announcement period bidders who finance the acquisition substantially with equity (i.e, equity offers and cash or equity offers) experience an increase in their share price. In the post announcement period while cash bids have consistently positive returns, the returns to equity bids is consistently negative.

The most unusual result in Figures 8.12-8.14 is the post announcement performance of cash & equity offers. Unlike the results for the targets (where the abnormal returns to cash & equity offers falls between the abnormal returns to cash offers and equity offers) the abnormal returns to cash & equity offers are lower than the abnormal returns to equity offers. This suggests that somehow cash

Figure 8.12.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Dimson model. Sample size:- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.

CAR for Bidders by Method of Payment

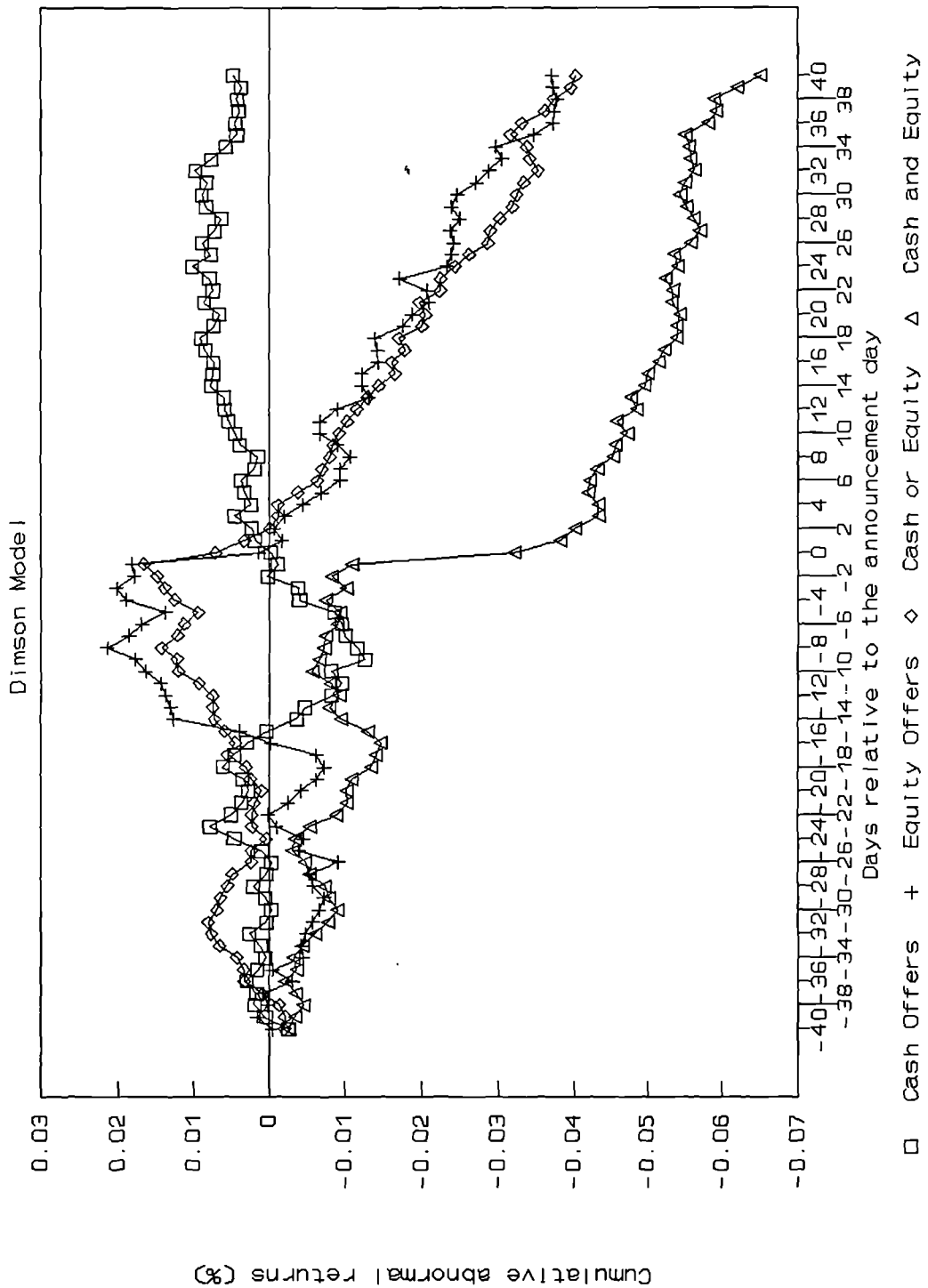


Figure 8.13.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Market Adjusted model. Sample size:- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.

CAR for Bidders by Method of Payment

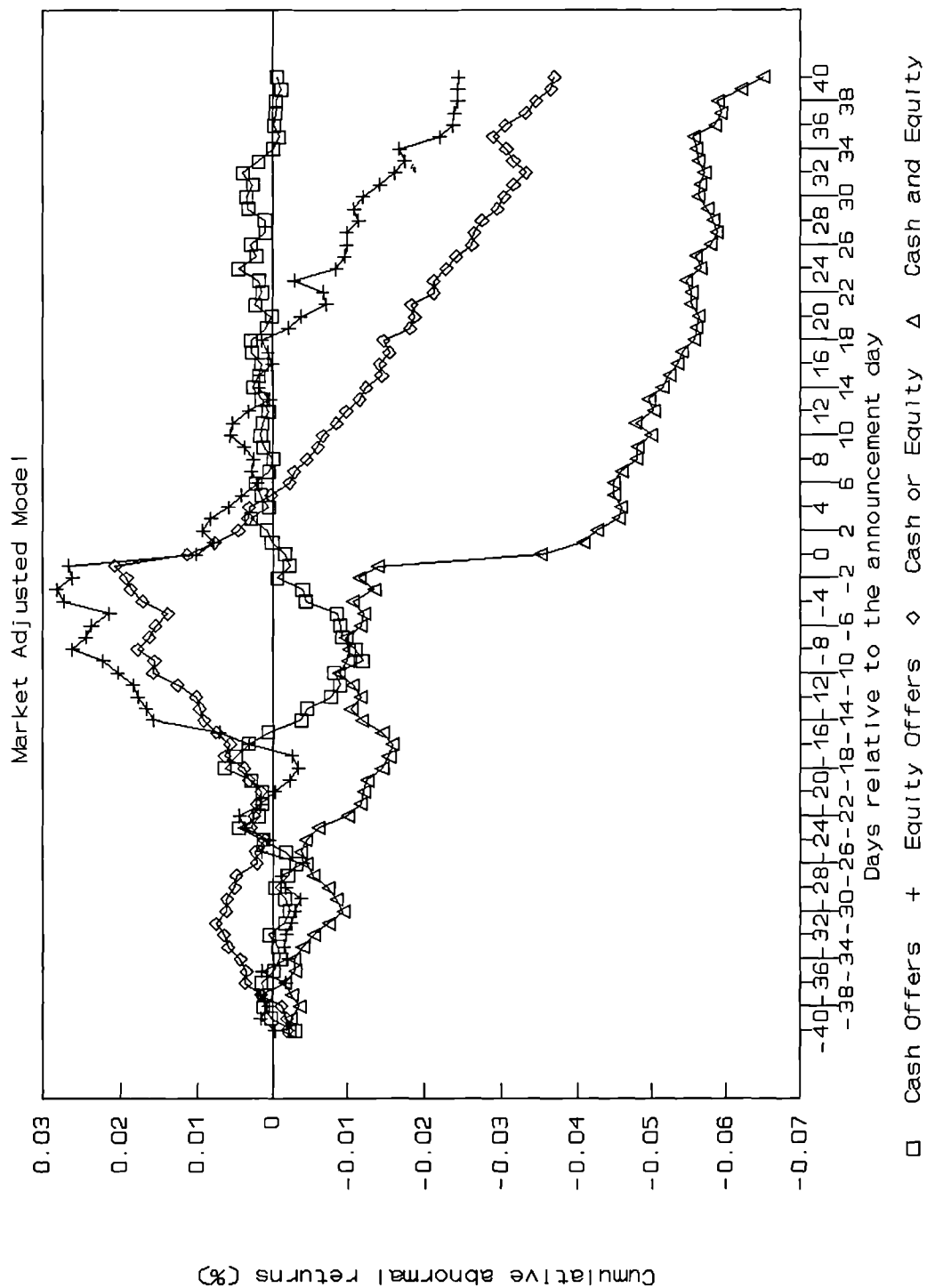
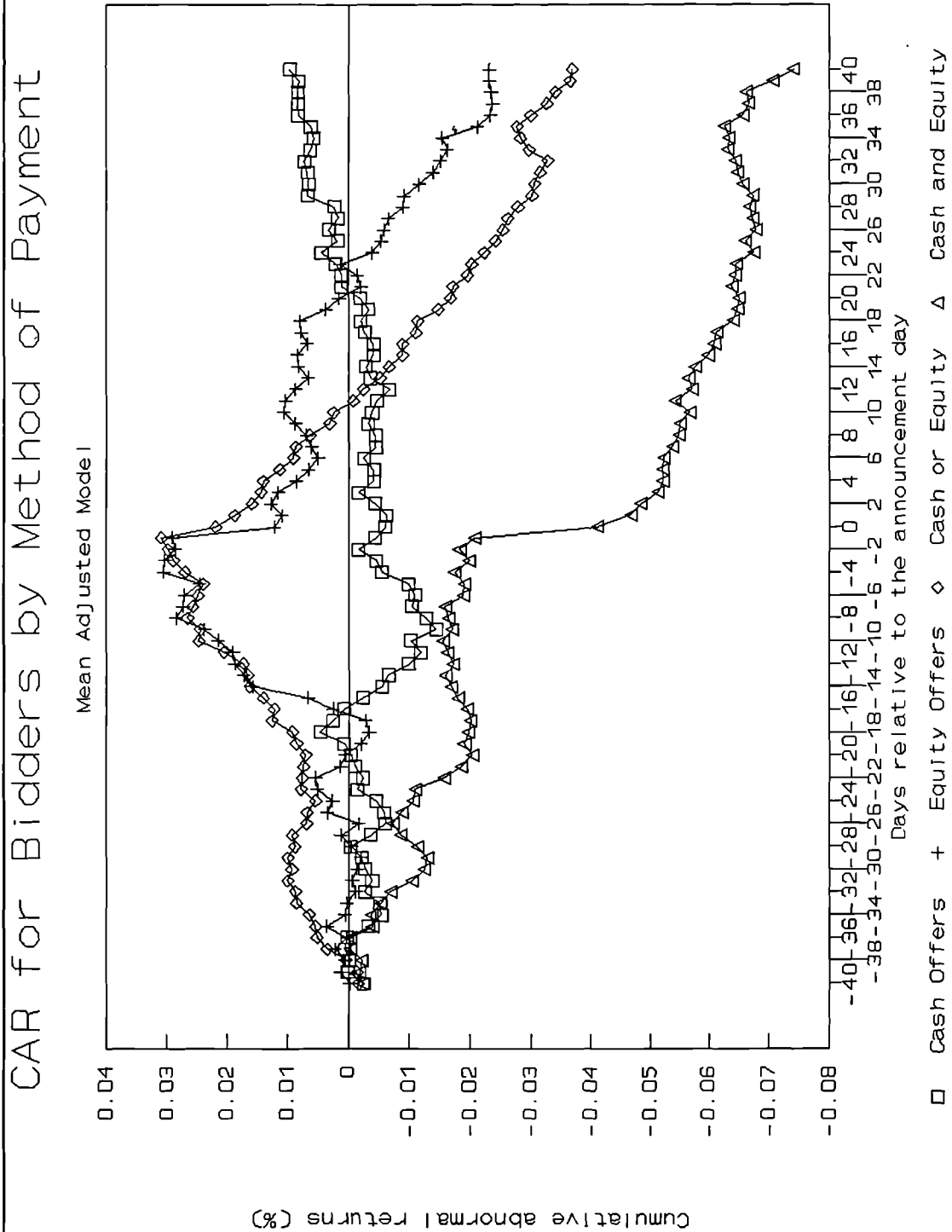


Figure 8.14.

Note: Day 0 is the bid announcement date. See text and Appendix 8.1 for a description of the Mean Adjusted model.
 Sample size :- Cash = 83, Equity = 88, Cash or Equity = 222, Cash and Equity = 111.



& equity offers send the worst signal to the market. To explore this anomalous result further, below we analyse the pre and post announcement behaviour of abnormal returns to bidders using different methods of payment.

In Tables 8.11 and 8.12 we look at the pre announcement (-40 to -1 days) abnormal returns behaviour of bidders analysed by the different methods of payment. Pre bid abnormal returns to offers with a substantial amount of equity (i.e, equity offers and cash or equity offers) are higher than those for offers with a large cash component (i.e, cash offers and cash & equity offers). This is consistent with the results we found earlier in Chapter 5 (see Sections 5.2.1 and 5.3) that bidders experiencing a short run increase in their share price are more likely to use equity as a method of payment.

In Tables 8.13 and 8.14 we examine the bidder's abnormal returns in post announcement period (+1 to +40 days). Since the method of payment cannot be fully anticipated by the market, the information impact of the different payment methods is concentrated in the post announcement period. The results show that all methods of payment which have an equity component, incur significant losses in the post announcement period. This difference in abnormal returns between cash offers and offers with an equity component over such a relatively short time period, is consistent with the argument that the use of equity conveys negative information to the market (see Sections 2.4.2 and 7.3.1).

Table 8.11

Cumulative abnormal returns to bidders over the period -40 to -1 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	-0.001 a=-0.08 b=-0.33 c=48.19	-0.002 a=-0.18 b=-0.41 c=48.19	-0.004 a=-0.08 b=-0.87 c=53.01
Cash or Equity	222	0.017* a=1.75 b=2.72 c=50.45	0.021** a=2.20 b=3.35 c=50.90	0.031* a=1.75 b=4.64 c=58.56
Cash and Equity	111	-0.011 a=-0.97 b=-0.37 c=44.14	-0.014 a=-1.30 b=-1.03 c=45.05	-0.021 a=-0.97 b=-1.82 c=46.85
Pure Equity	88	0.018* a=1.12 b=1.65 c=56.82	0.027* a=1.63 b=2.21 c=55.68	0.030* a=1.12 b=2.43 c=57.96
F-statistic.	504	1.31	2.25*	3.26**

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

Combining the results from Tables 8.11 and 8.13 shows that, while in the pre announcement period equity offers had higher returns than cash offers, in the post announcement period the returns to equity offers are lower than the returns to cash offers. This shows that our earlier result from Tables 8.9 and 8.10, that the valuation effects of cash offers and equity offers were comparable over the whole of the event period (-40 to +40 days) is due to the fact that bidders offering equity had a run up in their share prices in the pre bid period which when

Table 8.12

Pairwise comparison of the bidder's abnormal return over the period -40 to -1 days for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.31	0.62	-0.99
Cash or Equity		1.70*	-0.08
Cash & Equity			-1.39

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.61*	0.79	-1.46
Cash or Equity		2.35**	-0.31
Cash & Equity			-2.01**

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-2.13**	0.83	-1.41
Cash or Equity		2.79***	0.08
Cash & Equity			-1.99**

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

Table 8.13

Cumulative abnormal returns to bidders over the period +1 to +40 days by the method of payment.

Method of Payment	Sample Size	Dimson Model	Market Adjusted	Mean Adjusted
Pure Cash	83	0.005 a=0.37 b=0.36 c=54.22	0.001 a=0.09 b=0.19 c=50.60	0.016 a=1.04 b=1.31 c=62.65
Cash or Equity	222	-0.047*** a=-5.05 b=-5.24 c=38.29	-0.048*** a=-5.19 b=-5.00 c=40.09	-0.059*** a=-5.80 b=-5.89 c=40.99
Cash and Equity	111	-0.033*** a=-2.98 b=-3.47 c=32.43	-0.030*** a=-2.81 b=-3.20 c=34.23	-0.033*** a=-2.82 b=-3.23 c=34.23
Pure Equity	88	-0.038** a=-2.38 b=-2.61 c=42.05	-0.035** a=-2.14 b=-2.44 c=42.05	-0.036** a=-1.95 b=-2.50 c=44.32
F-statistic.	504	3.47*	2.68*	3.66**

Notes:

***, **, * Significant at the 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

averaged with the post announcement losses results in a total return which is comparable to the return in cash offers.

The losses incurred by cash & equity offer and pure equity offer bidders in the post announcement period are similar. This suggests some explanation for the earlier result that losses over the whole event period are larger for cash & equity offers than for pure equity offers. The pre announcement run up in the share price for equity offers is alleviating some of the post announcement losses,

Table 8.14

Pairwise comparison of the bidder's abnormal return over the period -40 to -1 days for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

Panel A: Results based on the Dimson Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	3.25***	2.15**	2.04**
Cash or Equity		-1.02	-0.51
Cash & Equity			0.27

Panel B : Results based on the Market Adjusted Model.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	2.90***	1.79*	1.76*
Cash or Equity		-1.24	-0.74
Cash & Equity			0.26

Panel C: Results based on the Mean Adjusted Model

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	3.40***	2.33**	2.10**
Cash or Equity		-1.40	-1.06
Cash & Equity			0.11

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

while the absence of any run up in the share price for cash & equity offer bidders results in significant losses over the whole event period.

8.5. Role of underwriters

The results above show that the use of equity conveys negative information to the market (see Tables 8.13 and 8.14). It has been suggested that the use of an underwriter may help alleviate some of the information problems associated with equity offers (Heinkel and Schwartz, 1985; Slovin et al, 1990). In a cash or equity offer, the underwriter agrees ex-ante to buy back the bidder's shares at a pre-determined price from those target shareholders who elect to accept the cash alternative. The contractual liability of the underwriter in such an agreement implies that it should have a reasonable knowledge of the value of the bidder's assets. Therefore the presence of an underwriter can signal that the bidder's shares are not overvalued, since underwriters would not normally agree to buy back overvalued assets. Bidders using an underwriter should therefore experience less negative abnormal returns than bidders without an underwriter.

To examine this issue, in Table 8.15 we analyse the returns to bidders offering "cash or equity" separating cash offers which are underwritten from cash offers which are not underwritten.

Bidders using an underwriter have higher pre-announcement returns but lower post-announcement returns

Table 8.15.

Cumulative abnormal returns to bidders using "equity offers with a cash alternative" as the method of payment.

	Sample Size	Window (Days) -40 to -40	Window (Days) -40 to -1	Window (Days) + 1 to + 40
Panel A: Dimson Model				
With an Underwriter	136	-0.0485** a=-2.54 b=-1.97 c=44.85	0.0242** a=1.81 b=3.16 c=55.15	-0.0579*** a=-4.39 b=-4.60 c=35.29
Without an Underwriter	86	-0.0272* a=-1.59 b=-1.65 c=40.70	0.0047 a=0.39 b=0.39 c=43.02	-0.0304** a=-2.57 b=-2.63 c=43.02
t-statistic		0.83	1.06	1.77*
Panel B: Market Adjusted Model				
With an Underwriter	136	-0.0438** a=-2.32 b=-1.32 c=41.91	0.0344** a=2.59 b=4.07 c=56.61	-0.0637*** a=-4.85 b=-4.56 c=37.50
Without an Underwriter	86	-0.0263* a=-1.64 b=-1.53 c=41.86	-0.0008 a=-0.07 b=0.26 c=41.86	-0.0240** a=-2.16 b=-2.30 c=44.19
t-statistic		0.59	1.70*	2.21**
Panel C: Mean Adjusted Model				
With an Underwriter	136	-0.0507** a=-2.57 b=-1.25 c=47.06	0.0450*** a=3.25 b=4.97 c=61.03	-0.0810*** a=-5.92 b=-5.51 c=38.97
Without an Underwriter	86	-0.0152 a=-0.85 b=-0.93 c=47.67	0.0087 a=0.69 b=1.21 c=54.65	-0.0241** a=-1.93 b=-2.53 c=44.19
t-statistic		0.99	1.66*	2.34**

Notes:

***, **, * Significant at 1%, 5%, 10% levels respectively.

a = t-statistic under the dependence assumption.

b = t-statistic under the independence assumption.

c = percentage of observations that are positive.

than bidders not employing an underwriter. Over the whole event period the presence of an underwriter results in greater losses for the bidder, although the difference is not statistically significant.

The higher pre-announcement returns to bidders using an underwriter suggest that these firms have stronger pre-bid performance and perhaps have less need for underwriting. It is plausible that these are firms which, having experienced a period of recent share price growth, are trying to assuage investor fears that the use of equity isn't an attempt to capitalise on this share price growth by converting overvalued paper into real assets. If this is the strategy, then it has obviously failed, since their post-announcement losses are quite significant. There are a number of plausible explanations for the larger negative post-announcement abnormal returns to bidders using an underwriter.

Significant fees are paid to the underwriters, apparently without any benefits in terms of a reduction in the information asymmetry problem. Osborne (1986) estimates that in addition to fees paid for advisory services, merchant banks involved in underwriting a cash alternative can normally expect 1/2% commitment commission paid to the lead underwriter, 1/2% commission paid to the sub-underwriters, 1/4% arrangement commission to the brokers. These are paid irrespective of whether the offer is successful. An additional 3/4% commission is payable to the sub-underwriters if the offer is successful. Bidders using

an underwriter could end up paying 2% in underwriting fees.

Potentially, after the completion of the bid, the underwriters could be left holding a large block of shares in the bidder, if a significant number of target shareholders accept the cash offer. This may create a fear that eventually a large block of shares would be dumped in the market in the aftermath of the bid. This fear of an "overhang" from the bid may depress the bidder's share price and so contribute to the observed negative abnormal returns.

Further, there is some evidence of mean reversion in the behaviour of share prices (DeBondt & Thaler, 1985; DeBondt & Thaler, 1987) ie, companies that have experienced periods of exceptional share price increases, subsequently experience significant share price falls and vice versa. It is plausible that the higher pre-bid announcement rises in the share price of bidders employing an underwriter through the mean reversion process is contributing to the larger post announcement losses.

8.6. Impact of capital gains tax, information asymmetry and debt co-insurance on shareholder wealth

In this section we investigate the source of the higher returns to cash offers. We regress the announcement period abnormal returns on variables which control for the impact of capital gains tax, information asymmetry and debt co-insurance.

By controlling for capital gains tax, information

asymmetry and debt co-insurance effects, we can examine directly whether, the tax, information asymmetry or the debt arguments explain the higher returns to cash offers.

Based on the discussion in Chapter 7, the following specific hypotheses are tested:

'Bidder's information asymmetry hypothesis, H1': Returns to bidder shareholders and the amount of information asymmetry about the value of the bidder existing between bidder managers and target shareholders will be positively related in a cash offer and negatively related in an equity offer.

'Target's information asymmetry hypothesis, H2': In an equity offer, returns to the target shareholders are negatively related to the amount of information asymmetry between the bidder and target. In a cash offer, information asymmetry has no effect on the returns to the target shareholders.

'Capital gains tax hypothesis, H3': In a cash offer, the returns to the target shareholders are positively related to realisable capital gains, while the returns to the bidder shareholders are negatively related to realisable capital gains. In an equity offer, realisable capital gains have no impact on the returns to the bidder and target shareholders.

'Wealth transfer hypothesis, H4': The returns to both the target's and the bidder's shareholders will be negatively related to the change in risk of the merged firm's returns, however the relationship between the change in the variance of the merged firm's returns and the returns to the bidder

and target shareholders will be stronger in an equity offer than in a cash offer.

The above hypotheses are stated in terms of just cash offers and equity offers whereas the empirical analyses below are conducted in terms of four different methods of payment (cash offers, equity offers, cash and equity offers and cash or equity offers). Since "cash and equity" offers and "cash or equity" offers are hybrid offers comprising both cash and equity the effect of CGT, information asymmetry and debt co-insurance on these two methods of payment is likely to be an amalgamation of the impact which these variables have in cash offers and equity offers respectively. Consequently it is left to the data to clarify the effects of CGT, information asymmetry and debt co-insurance on "cash and equity" offers and "cash or equity" offers.

8.5.1. Description of explanatory variables

Capital gains tax (CGAIN)

The tax based explanations for the higher returns to cash offers suggest that target shareholders in cash offers are compensated for the immediate crystallisation of their CGT liability (see Sections 2.5 and 7.4). While this argument may explain the higher returns to target shareholders, it is inconsistent with the evidence that bidders also have higher returns in cash offers, since the compensation premium paid is at the expense of the bidder. The tax variable (CGAIN) which measures short run capital

gains is:

$$CGAIN = \frac{\text{Pre-bid Mkt Value Of The Target} - \text{Lowest Mkt Value Of The Target}}{\text{Lowest Mkt Value Of The Target}}$$

From hypothesis H3 we expect that in cash offers CGAIN should be positively related to the target's CAR and negatively related to the bidder's CAR, while in equity offers CGAIN should not affect the returns to either bidders or targets.

Information asymmetry (BIDSTD & TAGSTD)

An equity offer is likely to be associated with negative information about the bidder and results in a drop in the market value of the bidder (see Sections 2.4.2 and 7.3.1). The fall in the market value of the bidder should be positively related to the level of information disparity between the market and the firm. Uncertainty about the value of the target results in an equity offer by the bidder and a reduction in the premium paid to target shareholders (see Section 7.3.2).

Direct measurement of information asymmetry is not easy, since it is based on the existence of private information which cannot be observed. Dierkens (1991) presents a model which allows an indirect measurement of information asymmetry. Dierkens suggests that the standard deviation of the market adjusted returns can be used as a suitable proxy for information asymmetry. The total

uncertainty about the value of a firm faced by an external investor is made up of two components: uncertainty due to market wide influences (e.g, interest rates, inflation etc) and uncertainty due to firm specific variables (e.g, future production plans, impact of competitors etc). Managers as insiders acquire knowledge of firm specific factors before the market does, although with the passage of time, firm specific information known to managers will be passed to the market.

If the variance of the market's return (σ^2_{mkt}) measures the uncertainty about market wide factors, while the variance of the firm's returns (σ^2_{firm}) measures uncertainty about both market wide and firm specific factors, then σ^2_{firm} minus σ^2_{mkt} measures the uncertainty about firm specific factors faced by external investors⁵. The volatility of the firm's market adjusted return (standard deviation) is used as a proxy for σ^2_{firm} minus σ^2_{mkt} .

The standard deviation of the firm's market adjusted returns is measured over the 250 trading days ending 40 days before the announcement of the bid. This is referred to as BIDSTD and TAGSTD for bidders and targets respectively.

From hypothesis H1 we expect that, in an equity offer, the returns to the bidder will be negatively related to BIDSTD, while, in a cash offer, they will be positively correlated.

⁵This implies an assumption that beta equals one.

From hypothesis H2 we expect that, in an equity offer, the returns to the target will be negatively correlated with TAGSTD, while in a cash offer, TAGSTD will not influence the returns to the target.

Debt co-insurance effect (DEBTINS)

The debt co-insurance argument (see Section 7.5) suggests that if a merger results in a fall in the variance of the combined firm's returns, and hence the riskiness of debt, then bondholders should gain while shareholders lose. If the correlation of returns to bidders and targets is zero, then the variance of the merged firm's returns is simply the average of the variance of returns of the individual firms weighted by their respective market values, i.e:

$$\sigma_{\rho=0}^2 = MV_{bid}^2 \sigma_{bid}^2 + MV_{tag}^2 \sigma_{tag}^2$$

where:

σ_{bid}^2 and σ_{tag}^2 are the pre-bid variance of the bidder's and the target's returns respectively;

MV_{bid} and MV_{tag} are the market values of the bidder and the target respectively;

ρ is the correlation of returns to the bidder and the target.

With ρ equal to zero the merger has not changed the risk profile of the merged firm and hence there is no redistribution of wealth between bondholders and shareholders. If ρ is not equal to zero, then the variance

of the merged firm's returns is given by:

$$\sigma_{\rho \neq 0}^2 = MV_{bid}^2 \sigma_{bid}^2 + MV_{tag}^2 \sigma_{tag}^2 + 2\rho MV_{bid} MV_{tag} \sigma_{bid} \sigma_{tag}$$

If ρ is negative, then the variance of the merged firm's returns will fall and wealth will be transferred from the shareholders to bondholders, while a positive ρ will increase the variance of the merged firm's returns and result in a transfer of 'wealth' from bondholders to shareholders. The change in the variance of the merged firm's return resulting from the correlation of returns on the bidder and the target being non-zero is:

$$DEBTINS = \frac{\sigma_{\rho=0}^2}{\sigma_{\rho \neq 0}^2}$$

If ρ is negative and the merger reduces the variance of the merged firm's returns, then DEBTINS will be greater than one, while with a positive ρ the merger increases the variance of the merged firm's returns and DEBTINS will be less than one.

The variance of the pre-bid returns is measured over 250 trading days ending 40 days before the announcement of the bid⁶. Market value is measured 41 days before the announcement of the bid.

⁶The wealth transfer theory is concerned with changes in the total return of the firm (ie, returns to debt and equity). Our proxy (which is similar to that used by Eger, 1983 and Travlos, 1987) is deficient to the extent that it only measures changes in the returns to equity. Changes in the firm's total return are difficult to calculate because corporate debt in the UK is generally unquoted.

From hypothesis H4 if there is a debt co-insurance effect then the statistical relationship between DEBTINS and the returns to the bidder and the target will be stronger in equity offers than in cash offers.

The definitions of the variables discussed above are summarised in Table 8.16.

Table 8.16.
Explanatory variables influencing the wealth experience of shareholders in takeovers. ,

Variable	Definition
CGAIN	(Target's day -41 market value - target's lowest market value over the preceding one year) / the target's lowest market value.
BIDSTD	Standard deviation of the bidder's market adjusted daily abnormal returns measured over the 250 trading days ending 40 days before the announcement of the bid.
TAGSTD	Standard deviation of the target's market adjusted daily abnormal returns measured over the 250 trading days ending 40 days before the announcement of the bid.
DEBTINS	Variance of the merged firm's returns, assuming the correlation of returns to the bidder and target is zero / variance of the merged firm's returns, if the correlation of returns to the bidder and target is not equal to zero

Table 8.17 reports the mean, median and standard deviation for the explanatory variables, while Table 8.18 reports the results of the difference in means test comparing the mean for each explanatory variable across the different method of payments.

The F-statistic shows that potential short run capital gains realisable by target shareholders (CGAIN) is not significantly different across methods of payment. This is

Table 8.17.

Impact of the method of payment on shareholder wealth:
Descriptive statistics for the explanatory variables.

The variables are defined in Table 8.16.

	MEAN	MEDIAN	STD DEV	No OF OBS.
Variable: CGAIN				
Whole sample	0.546	0.332	1.276	504
Cash offers	0.410	0.273	0.616	83
Equity offers	0.431	0.270	0.441	88
Cash and equity	0.547	0.309	0.825	111
Cash or equity	0.644	0.400	1.768	222
F-Statistic		0.98		
Variable: BIDSTD				
Whole sample	0.020	0.018	0.010	504
Cash offers	0.020	0.018	0.008	83
Equity offers	0.022	0.018	0.012	88
Cash and equity	0.018	0.016	0.009	111
Cash or equity	0.020	0.018	0.010	222
F-Statistic		2.79**		
Variable: TAGSTD				
Whole sample	0.022	0.020	0.010	504
Cash offers	0.022	0.020	0.009	83
Equity offers	0.026	0.023	0.014	88
Cash and equity	0.020	0.018	0.009	111
Cash or equity	0.022	0.020	0.009	222
F-Statistic		6.57***		
Variable: DEBTINS				
Whole sample	0.943	0.970	0.078	504
Cash offers	0.970	0.991	0.062	83
Equity offers	0.914	0.944	0.099	88
Cash and equity	0.922	0.942	0.078	111
Cash or equity	0.955	0.974	0.067	222
F-Statistic		12.61***		

Note:

***, **, * Significant at the 1%, 5% 10% levels respectively.

Table 8.18.

Difference in means test for the variables explaining the impact of the method of payment on shareholder wealth.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances. The explanatory variables are defined in Table 8.16.

Panel A: Results for the variable CGAIN.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	-1.71	-1.33	-0.26
Cash or Equity		0.68	1.66*
Cash & Equity			1.27

Panel B : Results for the variable BIDSTD.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	0.34	1.82*	-1.15
Cash or Equity		1.68*	-1.48
Cash & Equity			-2.60**

Panel C: Results for the variable TAGSTD.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	0.39	1.95*	-2.18**
Cash or Equity		1.88*	-2.67***
Cash & Equity			-3.72***

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

Table 8.18. (Continued).

Difference in means test for the variables explaining the impact of the method of payment on shareholder wealth.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances. The explanatory variables are defined in Table 8.16.

Panel D: Results for the variable DEBTINS.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.83*	4.76***	4.48***
Cash or Equity		3.74***	3.56***
Cash & Equity			0.63

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

consistent with the earlier evidence in Sections 5.2 and 5.3 that CGT does not significantly affect the choice of payment by the bidder. The CGT compensation hypothesis predicts that potential capital gains (CGAIN) should be lower in cash offers than in equity offers. The results show that potential CGT (CGAIN) is lower in cash offers than in offers with an equity component. However this evidence in support of the CGT compensation hypothesis is weak and statistically insignificant.

The standard deviation of the pre bid market adjusted abnormal returns (BIDSTD & TAGSTD) is about 0.02, however the F-statistic shows that there are significant variations

across payment methods. Information asymmetry about the bidder (BIDSTD) is higher in pure equity offers than in offers with a cash component. This suggests that information asymmetry about the value of the bidder is more likely to result in an overvaluation of the bidder, hence resulting in bidding managers offering equity as the method of payment⁷ (Myers and Majluf, 1984).

Information asymmetry about the value of the target (TAGSTD) is significantly higher in equity offers than in offers with a cash component. This is consistent with Hansen's (1987) (see Section 2.4.1) model that where the bidder is uncertain about the value of the target then an equity offer is an effective means of sharing the valuation risk faced by the bidder with the target shareholders.

Contrary to the implication of the prediction that wealth is transferred from shareholders to bondholders (Higgins & Schall, 1975; Galai & Masulis, 1976) we find that the merger has increased the riskiness of the combined firm (DEBTINS is less one)⁸. This effect is similar across all methods of payment with the largest increase occurring in equity bids. This increase in riskiness is consistent with the arguments of Smith & Warner (1979) and Jensen &

⁷If information asymmetry about the value of the bidder resulted in an undervaluation of the bidder, then Myers and Majluf (1984) (see Section 2.4.2) predicts that the bidder would offer cash as the method of payment. In this scenario information asymmetry (BIDSTD) would be higher in cash offers than in equity offers.

⁸The average correlation coefficient between the target and the bidder's pre-bid returns is 0.13. If the on average mergers were meant to reduce the riskiness of the combined firm, then the correlation coefficient between the bidder and the target's pre-bid returns should be negative.

Meckling (1986), who suggest that the wealth redistribution can flow from bondholders to shareholders. They suggest that managers of firms with outstanding debt can seek to transfer wealth from the bondholders to the shareholders by investing in projects that increase the riskiness of the firm. Since a merger is another form of corporate investment, the increase in riskiness resulting from the investment, would increase the default risk on the outstanding debt, resulting in a transfer of wealth from the bondholders to the shareholders.

8.5.2. Target returns and the method of payment

In Table 8.19 we report the findings from the cross sectional regressions with target's CAR as the dependent variable. To test for heteroskedasticity in the regressions we use the Breusch-Pagan test (See Maddala, 1989: p.164). As we shall see below a significant number of our regression models suffer from heteroskedasticity. We use White's (1978) procedure to correct for heteroskedasticity in estimating the regression standard errors.

The impact of the explanatory variables on shareholder wealth is dependent on the method of payment (see hypothesis H1, H2, H3 and H4)⁹, hence we estimate the regression model for the entire sample and for the different methods of payment. Unfortunately the results are very disappointing.

⁹For example, from hypothesis H1, we expect that in cash offers information asymmetry will have a positive impact on the bidder's abnormal returns and a negative impact in equity offers.

Table 8.19.

Regression of the cumulative abnormal returns (CAR) to the target on explanatory variables.

The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel A: Results based on the Dimson model.							
	CONSTANT	TAGSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	0.12 (0.78)	-3.78** (-2.00)	0.29** (1.99)	-0.05** (-1.93)	99.54***	11.54***	0.06
Cash offers (n=83)	-0.31 (-0.09)	-1.91 (-0.50)	0.47* (1.49)	-0.13** (-1.98)	2.89	2.64*	0.06
Equity offers (n=88)	0.25 (0.89)	-2.99 (-0.93)	0.05 (0.17)	-0.02 (-0.13)	9.08**	0.66	-0.01
Cash and equity (n=111)	0.27 (1.02)	-1.08 (-0.34)	0.13 (0.47)	-0.18** (-2.17)	49.66***	11.77***	0.23
Cash or equity (n=222)	0.26 (0.87)	-3.68 (-1.09)	0.14 (0.51)	-0.03*** (-2.71)	53.84***	3.55**	0.03

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

Table 8.19 (Continued).
Regression of the cumulative abnormal returns (CAR) to the target on explanatory variables.
The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel B: Results based on the market adjusted model.							
	CONSTANT	TAGSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	0.17 (1.20)	-4.65*** (-2.46)	0.25** (1.73)	-0.05** (-1.91)	82.99***	13.19***	0.07
Cash offers (n=83)	0.02 (0.07)	-2.36 (-0.62)	0.45* (1.36)	-0.10* (-1.33)	3.51	1.68	0.02
Equity offers (n=88)	0.47** (1.81)	-2.69 (-0.77)	-0.13 (-0.49)	-0.18** (-2.26)	10.80**	3.77**	0.09
Cash and equity (n=111)	0.25 (0.96)	-0.82 (-0.26)	0.15 (0.54)	-0.17** (-2.31)	27.14***	10.46***	0.21
Cash or equity (n=222)	0.32 (1.12)	-4.24 (-1.27)	0.10 (0.33)	-0.03*** (-2.42)	47.43***	3.85**	0.04

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

Table 8.19 (Continued).

Regression of the cumulative abnormal returns (CAR) to the target on explanatory variables.

The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel C: Results based on the mean adjusted model.							
	CONSTANT	TAGSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	0.27** (1.74)	-3.98** (-2.05)	0.15 (0.96)	-0.05** (-1.96)	85.69***	12.87***	0.07
Cash offers (n=83)	0.20 (0.68)	-0.02 (-0.04)	0.24 (0.76)	-0.14** (-1.86)	5.49	2.61*	0.06
Equity offers (n=88)	0.67*** (2.48)	-2.16 (-0.61)	-0.34 (-1.20)	-0.22*** (-2.89)	8.54**	4.64***	0.11
Cash and equity (n=111)	0.12 (0.51)	1.32 (0.39)	0.24 (0.97)	-0.18** (-2.21)	51.85***	11.17***	0.22
Cash or equity (n=222)	0.51** (1.63)	-3.91 (-1.13)	0.10 (0.32)	-0.04*** (-2.54)	39.51***	4.08***	0.04

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

Information asymmetry about the target's assets (TAGSTD) has a significant negative effect on the target's returns, suggesting that bidders offer lower premia when they are uncertain about the value of the target's assets. However, this effect does not appear to be related to the method of payment.

The change in the variance of the returns to the merged firm (DEBTINS) has a positive effect on the returns to the target. This suggests that returns to target shareholders are higher when the post merger risk of the combined firm falls. This is inconsistent with the wealth transfer hypothesis H4 predicts that a fall in the riskiness of the merged firm leads to a wealth transfer from shareholders to bondholders. There is some support for the prediction from the wealth transfer hypothesis H4 that the equity offers provide the greatest opportunity for wealth transfers between shareholders and bondholders. For equity offers under the market adjusted model and the mean adjusted model there is a negative relationship between returns to the target shareholders and the change in the risk of the merged firm's returns. However the result is statistically insignificant and sensitive to the choice of control model.

The effect of capital gains tax on the returns to the target is very surprising. We find that the greater the potential short run capital gains (CGAIN), the lower the returns to the target. This result is uniform across payment methods and is inconsistent with the capital gains

tax hypothesis H3. A possible explanation for this result is that the short run capital gains in a target reflects the efficiency with which the firm is presently being managed. Consequently there is minimal scope for creating post merger gains in a firm which is highly valued prior to the bid. If there is a positive tax compensation effect in the returns to the target, then it is dominated by the inability of bidders to extract substantial gains from firms which are presently well managed.

8.5.3. Bidder returns and the method of payment

In Table 8.20, we report the results on the cross sectional analysis of the bidder's returns.

There is support for hypothesis H1 that information asymmetry results in investors reacting negatively to the use of equity by the bidder. Across the whole of the sample, we find that information asymmetry about the bidder's shares (BIDSTD) has a negative effect on the returns to the bidder. However the negative relation observed between abnormal returns and the standard deviation of the bidder's pre-bid market adjusted returns is caused primarily by those bids which have an equity component. In cash offers the level of information asymmetry has a positive effect on the returns to the bidder. This indicates that in situations where the market believes that managers have a large amount of private information, a cash offer is seen as a signal of positive private information, while an offer with an equity

Table 8.20.

Regression of the cumulative abnormal returns (CAR) to the bidder on explanatory variables.

The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel A: Results based on the Dimson model.							
	CONSTANT	BIDSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	-0.19** (-1.71)	-4.31*** (-2.79)	0.25** (2.16)	-0.01 (-0.18)	98.38***	8.24***	0.04
Cash offers (n=83)	-0.36 (-1.13)	4.72** (1.71)	0.34 (1.00)	-0.12*** (-4.54)	11.11**	6.31***	0.16
Equity offers (n=88)	-0.01 (-0.44)	-2.61 (-1.09)	0.16 (0.75)	-0.08* (-1.37)	12.92***	1.53	0.02
Cash and equity (n=111)	-0.33* (-1.51)	-8.59*** (-2.86)	0.42** (1.85)	0.03 (1.24)	24.95***	6.70***	0.14
Cash or equity (n=222)	-0.62 (-0.34)	-6.17*** (-3.31)	0.14 (0.79)	-0.01** (-1.92)	21.85***	5.18***	0.05

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

Table 8.20 (Continued).
Regression of the cumulative abnormal returns (CAR) to the bidder on explanatory variables.

The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel B: Results based on the market adjusted model.							
	CONSTANT	BIDSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	-0.14 (-1.23)	-2.92** (-1.69)	0.17* (1.49)	0.01 (0.25)	99.71***	3.70**	0.02
Cash offers (n=83)	-0.20 (-0.64)	4.50** (1.77)	0.18 (0.53)	-0.13*** (-7.04)	7.41*	7.25***	0.19
Equity offers (n=88)	-0.40 (-0.19)	-0.04 (-0.01)	0.06 (0.29)	-0.10* (-1.58)	9.84**	1.09	0.01
Cash and equity (n=111)	-0.23 (-1.15)	-6.19** (-2.29)	0.29* (1.43)	0.01 (0.09)	27.68***	4.25***	0.08
Cash or equity (n=222)	-0.03 (-0.14)	-5.39*** (-2.83)	0.09 (0.49)	0.01*** (4.87)	23.74***	4.21***	0.04

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

Table 8.20 (Continued).
Regression of the cumulative abnormal returns (CAR) to the bidder on explanatory variables.

The dependent variable is CAR over the period -40 to +40 days. The independent variables are defined in Table 8.16. t-statistics are in parentheses.

Panel C: Results based on the mean adjusted model.							
	CONSTANT	BIDSTD	DEBTINS	CGAIN	B-PAGAN TEST	F-STAT	ADJ R ²
Whole Sample (n=504)	-0.02 (-0.15)	-2.67** (-1.47)	0.06 (0.43)	-0.03** (-1.77)	97.50***	5.16***	0.02
Cash offers (n=83)	0.05 (0.15)	5.50** (1.96)	-0.06 (-0.18)	-0.20*** (-6.23)	1.31	12.05***	0.29
Equity offers (n=88)	0.25 (1.10)	0.24 (0.09)	-0.22 (-0.97)	-0.17** (-2.11)	14.47***	2.14*	0.04
Cash and equity (n=111)	-0.31* (-1.30)	-3.54 (-1.24)	0.35* (1.52)	0.05 (1.18)	20.81***	3.47**	0.06
Cash or equity (n=222)	0.13 (0.61)	-6.16** (-2.30)	-0.04 (-0.18)	-0.01*** (-3.11)	36.14***	3.57**	0.03

Notes:

- 1) ***, **, * Significant at 1%, 5% and 10% levels respectively, one tail test.
- 2) B-Pagan test refers to the Breusch and Pagan test for heteroskedasticity.
ADJ R² = Adjusted R²

component transmits a negative signal.

The change in the post-merger variance of the merged firm's returns (DEBTINS) is positively related to the bidder's abnormal returns. This is inconsistent with the wealth transfer hypothesis H4. There is weak support for a wealth transfer between shareholders and bondholders under the mean adjusted model. With this model, the abnormal returns to bidders offering equity are lower, the bigger the fall in the post bid variance of the merged firm's returns. However this result is unstable and sensitive to the choice of control model.

The short run potential capital gains in the target (CGAIN) has a negative effect on the bidder's returns, with the strongest effect being observed in cash offers. Although consistent with the capital gains tax hypothesis H3, the evidence requires cautious interpretation given our earlier result that short run capital gains have a negative effect on the target's returns. A more realistic interpretation is that short run capital gains have a negative effect on the returns to the bidder because of the limited scope for realising gains in well managed targets.

8.6. Conclusion

In this chapter, we analysed the impact which the method of payment has on the wealth of both bidder and target shareholders, using both univariate difference in means tests and multiple regression analyses. Consistent with existing evidence, we find that returns to both

bidders and targets are higher in cash offers than in equity offers. We investigate the source of this higher return to cash offers.

We find evidence that the method of payment is associated with an information signalling effect, in which the use of equity by the bidder conveys negative information to the market, while the use of cash transmits a positive signal.

The argument that compensation for CGT would result in higher bid premium to target shareholders when cash is offered as the method of payment is rejected. Contrary to the CGT compensation hypothesis, we find that short run capital gains for target shareholders lead to negative returns in both the target and the bidder. Our results do not support the argument that potential changes in the variance of returns to the merged firm redistribute wealth from shareholders to bondholders.

Bidders offering equity as the method of payment tend to have experienced a significant increase in their share price in the pre announcement period. However, the higher this pre-announcement increase in the bidder's share price, the greater is the post-announcement loss. The use of an underwriter by the bidder as a signalling device does not mitigate the post announcement losses of bidders offering equity as the method of payment.

The implications of the results found in this study and the directions for future research are discussed in the next chapter.

APPENDIX 8.1.

EVENT STUDY METHODOLOGY

For each company i , we define an abnormal return AR_{it} as

$$AR_{it} = R_{it} - C_{it}$$

R_{it} is the continuously compounded realised return on day t (dividend plus capital gains). This is calculated as¹

$$R_{it} = \text{Log} \frac{P_{it} + D_{it}}{P_{i,t-1}}$$

P_{it} = Price of company i 's share at the end of trading on day t .

D_{it} = Dividends received on day t .

t is time defined relative to the bid announcement date. The definition of the bid announcement date is given in Section 4.5.

C_{it} is the control rate of return which is what company i 's return would have been in the absence of the event. In order to ensure that our results are not sensitive to the models used in specifying the control rate of return, we shall use three alternative models to determine C_{it}

¹An alternative method of calculating R_{it} is to use discrete returns, where

$$R_{it} = \frac{P_{it} + D_{it} - P_{i,t-1}}{P_{i,t-1}}$$

We have choose to use logarithmic returns, because when linking sub-periods together to form longer event periods, logarithmic returns can be simply added together, whereas discrete returns cannot be easily manipulated in this way. Additionally logarithmic returns are more likely to be normally distributed.

Model 1 : The market model

$$C_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$

where

R_{mt} is the continuously compounded realised return on day t for the market index.

α_i is the regression constant obtained from regressing R_{it} on R_{mt} . This measures the mean return over the estimation period which is not explained by the market.

β_i is the regression co-efficient obtained from regressing R_{it} on R_{mt} . This is a measure of the sensitivity of firm i 's return to the market return (ie, systematic risk).

ϵ_i is an error term with a mean of zero and a constant variance.

The values of α_i and ϵ_i are obtained by regressing R_{it} on R_{mt} for the 250 trading days (if possible) or fewer observations (with a minimum of 120 days) beginning at $t = -290$, where $t = 0$ is the event day.

Model 2 : The market adjusted model

The control rate of return for any firm in the event period² is the return on the market index for that day.

$$C_{it} = R_{mt}$$

²Event period refers to the number of days over which abnormal returns centred on the event day are cumulated in order to estimate the impact of the event on shareholder wealth. In this thesis event period is -40 to +40 days centred on the acquisition announcement date.

This model is equivalent to the market model where for all firms $\alpha_i = 0$ and $\beta_i = 1$.

Model 3 : The mean adjusted return model

The control rate of return for any firm for a day in the event period is the mean daily return of the firm over the estimation period (ie, -290 to -41 days).

$$C_{it} = \frac{\sum_{t=-290}^{t=-41} R_{it}}{250}$$

This model assumes that the expected return for company i is a constant that can vary across firms. The model would be accurate if the risk free rate, risk premia³ and a company's systematic risk are constant over time.

Cumulative abnormal returns

For each day in the event period, the abnormal returns are averaged across firms to produce the sample average abnormal return for that day AR_t .

$$AR_t = \frac{\sum_{i=1}^N AR_{it}}{N}$$

³The risk premia refers to the difference between the return on the market index and the risk free rate. For a fuller discussion see Copland & Weston (1983: Chapter 7).

Where N is the number of firms in the sample.

The average cumulative abnormal returns (CAR) for N firms over a number of days from t1 to t2 is calculated by summing AR_t over the period from t1 to t2.

$$CAR_{t1, t2} = \sum_{t=t1}^{t=t2} AR_t$$

The null hypothesis examined under the event study is that $AR_t = 0$ and $CAR_{t1, t2} = 0$. The test statistic under the null hypothesis can be calculated based on the assumption of either cross-sectional independence or cross-sectional dependence in the abnormal returns.

Test statistic assuming cross sectional independence

The test statistics described below assume that the cross sectional correlation between the abnormal returns for any two firms i and j equals zero. This assumption would be valid where the event dates for the sample takeovers are diffusely spread over a long period of calendar time.

Each abnormal return AR_{it} is divided by its estimated standard deviation $SD(AR_{it})$ to yield the standardised abnormal return SAR_{it} .

$$SAR_{it}^{IND} = \frac{AR_{it}}{SD(AR_{it})}$$

where

$$SD(AR_{it}) = \sqrt{\frac{\sum_{t=-290}^{t=-41} (AR_{it} - \overline{AR_i})^2}{249}}$$

and

$$\overline{AR_i} = \frac{\sum_{t=-290}^{t=-41} AR_{it}}{250}$$

For a sample of N firms, the test statistic for day t is the standardised abnormal return for day t SAR_t^{IND} .

$$SAR_t^{IND} = \frac{\sum_{i=1}^N SAR_{it}^{IND}}{\sqrt{N}}$$

For a large N, SAR_t^{IND} has a normal distribution $N(0,1)$.

For tests over the multi-day interval t1 to t2, the test statistic is the standardised cumulative abnormal return $SCAR_{t1,t2}^{IND}$.

$$SCAR_{t1,t2}^{IND} = \frac{\sum_{t=t1}^{t=t2} SAR_t^{IND}}{\sqrt{t2 - t1 + 1}}$$

Test statistics assuming cross sectional dependence

Where the event dates for the takeovers are clustered in calender time, or the firms concerned are in the same or related industries, then the assumption of cross sectional independence in the abnormal returns would be violated. Test statistics which adjust for cross sectional dependence are described below.

The test statistic for event day t is

$$SAR_t^{DEP} = \frac{AR_t}{SD(AR)}$$

where

$$SD(AR) = \sqrt{\frac{\sum_{t=-290}^{t=-41} (AR_t - \overline{AR})^2}{249}}$$

and

$$\overline{AR} = \frac{\sum_{t=-290}^{t=-41} AR_t}{250}$$

For tests over the multi day interval t_1 to t_2 , the test statistic is

$$SCAR_{t1,t2}^{DEP} = \frac{CAR_{t1,t2}}{SD(AR) * \sqrt{t2 - t1 + 1}}$$

The problem of thin trading

The market model estimates of beta can be subject to a downward estimation bias if shares are thinly traded. Thin trading occurs, when the price recorded at the end of a trading day for a security relates to a transaction occurring well before that trading day. Dimson (1979) shows that the estimated betas of infrequently traded securities rise as the returns measurement⁴ interval rises. This implies that when using daily returns the market model estimates of beta for thinly traded shares have a downward bias, while for frequently traded shares the bias is upward. Biased beta estimates will result in biased estimates of abnormal returns and consequently misspecified results in an event study. A number of approaches have been suggested in the literature to correct for such thin trading bias. (Scholes and Williams, 1977; Dimson, 1979; Fowler and Rorke, 1983).

Scholes and Williams (1977) show that under the assumption that a transaction takes place in every measurement interval (ie, a security does not have any missing observation between day -1 and +1) a consistent estimate of beta is

⁴ie, betas calculated using monthly returns are higher than betas calculated using daily returns for infrequently traded shares.

$$\beta_{SW} = \frac{\beta^{-1} + \beta^0 + \beta^{+1}}{1 + 2\rho_1}$$

where

β^{-1} is the slope coefficient in a simple regression of R_{it} against $R_{m,t-1}$

β^0 is the slope coefficient in a simple regression of R_{it} against $R_{m,t}$

β^{+1} is the slope coefficient in a simple regression of R_{it} against $R_{m,t+1}$

ρ_1 is the first order serial correlation of the market index.

The Dimson (1979) aggregated coefficient estimator does not require that a transaction take place in every measurement interval. The Dimson estimator is obtained by regressing the security return on day t against leading, synchronous and lagged returns of the market index, in order to obtain a set of slope coefficients, β_t , which are then summed to give an unbiased estimate of true beta.

$$\beta_{DIM} = \sum_{t=-n}^n \beta_t$$

where β_t , $t = -n, \dots, 0, \dots, n$ are slope coefficients in a multiple regression of the return on the security in period t against the return on the market index in period $t-n, \dots, 0, \dots, t+n$.

Fowler and Rorke (1983) suggest a correction to the Dimson aggregated co-efficient method to equate it to the Scholes and Williams estimator. Fowler & Rorke show that when a security skips a single price observation, the correct beta estimate is

$$\beta_{FR} = \frac{\beta^{-2} + \beta^{-1} + \beta^0 + \beta^{+1} + \beta^{+2}}{1 + 2(\rho_1 + \rho_2)}$$

where

β^n is the slope co-efficient in a simple regression of the security return in period t on the return on the market in period $t+n$.

ρ_1 is the first order serial correlation coefficient of the market index.

ρ_2 is the second order serial correlation coefficient of the market index.

The β_{FR} expression can be generalised for securities that skip two or more consecutive observations.

$$\beta_{FR} = \frac{\beta^{-n} + \beta^{-n+1} + \dots + \beta^0 + \beta^1 + \dots + \beta^n}{1 + 2(\rho_1 + \rho_2 + \dots + \rho_n)}$$

To correct for thin trading in this study, we tried the correction procedures suggested by Scholes and Williams (1977), Fowler and Rorke (1983) and Dimson (1979) using alternative combinations of lead and lagged market return terms. The results of these various procedures are shown in Table A8.1.

Table A8.1.

Average betas using different procedures to correct for thin trading.

Number of Lag Terms	Number of Lead Terms	Targets	Bidders	Targets and Bidders
Scholes and Williams correction procedure.				
1	1	0.6129	0.8483	0.7306
Fowler and Rorke correction procedure.				
1	1	0.6537	0.9079	0.7808
2	2	0.6715	0.9238	0.7977
3	3	0.6752	0.9268	0.8010
4	4	0.6733	0.9151	0.7942
5	5	0.6779	0.9089	0.7934
Dimson correction procedure				
0	0	0.5152	0.7432	0.6292
0	1	0.4885	0.7270	0.6077
0	2	0.4857	0.7307	0.6082
0	3	0.4781	0.7252	0.6016
0	4	0.4569	0.7014	0.5792
0	5	0.4349	0.6742	0.5546
0	6	0.4309	0.6717	0.5513
1	0	0.6504	0.8761	0.7632
1	1	0.6257	0.8608	0.7432
1	2	0.6216	0.8662	0.7439
1	3	0.6106	0.8578	0.7342
1	4	0.5915	0.8321	0.7118
1	5	0.5697	0.8035	0.6866
1	6	0.5619	0.7978	0.6798

Table A8.1. (Continued)

Average betas using different procedures to correct for thin trading.

Number of Lag Terms	Number of Lead Terms	Targets	Bidders	Targets and Bidders
Dimson correction procedure				
2	0	0.6867	0.9260	0.8064
2	1	0.6619	0.9116	0.7867
2	2	0.6557	0.9173	0.7865
2	3	0.6454	0.9095	0.7774
2	4	0.6269	0.8828	0.7548
2	5	0.6049	0.8550	0.7299
2	6	0.5978	0.8474	0.7226
3	0	0.7035	0.9390	0.8213
3	1	0.6822	0.9274	0.8048
3	2	0.6762	0.9326	0.8044
3	3	0.6679	0.9247	0.7963
3	4	0.6511	0.8998	0.7755
3	5	0.6290	0.8723	0.7507
3	6	0.6203	0.8646	0.7424
4	0	0.7288	0.9607	0.8448
4	1	0.7066	0.9483	0.8275
4	2	0.7010	0.9526	0.8268
4	3	0.6924	0.9429	0.8177
4	4	0.6760	0.9187	0.7973
4	5	0.6542	0.8919	0.7731
4	6	0.6447	0.8845	0.7646
5	0	0.7524	0.9689	0.8607
5	1	0.7297	0.9555	0.8426
5	2	0.7236	0.9609	0.8423

Table A8.1. (Continued)

Average betas using different procedures to correct for thin trading.

Number of Lag Terms	Number of Lead Terms	Targets	Bidders	Targets and Bidders
Dimson correction procedure				
5	3	0.7135	0.9512	0.8324
5	4	0.6964	0.9299	0.8132
5	5	0.6765	0.9039	0.7902
5	6	0.6675	0.8976	0.7825
6	0	0.7616	0.9678	0.8647
6	1	0.7402	0.9556	0.8479
6	2	0.7339	0.9617	0.8478
6	3	0.7229	0.9532	0.8381
6	4	0.7070	0.9332	0.8201
6	5	0.6872	0.9072	0.7972
6	6	0.6770	0.8991	0.7881

The final model was selected on the basis of maximum average sample beta. The highest average beta for bidders and targets occurs with the Dimson correction procedure using 6 lags and 0 lead terms. The adjusted average betas in our sample are 0.9678 for bidders and 0.7616 for targets. This is comparable to the average betas in Franks and Harris (1989), they reported thin trade adjusted betas of 0.92 for bidders and 0.854 for targets. Targets have lower betas than bidders probably because they are smaller and hence more prone to the thin trading problem.

Choice of event window

In choosing the event window over which abnormal

Table A8.2.

Number of event days between the announcement date and the unconditional date by method of payment.

	MEAN	MEDIAN	STD DEV	No OF OBS
Whole sample	33.19	30.71	13.47	504
Cash offers	34.98	32.14	14.64	83
Equity offers	30.23	29.64	9.63	88
Cash and equity	35.57	32.14	14.57	111
Cash or equity	32.50	30.00	13.54	222
F-Statistic		3.30**		

Note:

***, **, * Significant at 1%, 5% and 10% levels respectively.

returns are cumulated we wish to choose a window which is sufficiently wide to allow us to capture all the valuation effects associated with the takeover announcement and yet not too wide that it introduces noise into the data.

The distribution of the number of event days between the announcement and the unconditional date is reported in Table A8.2.

Under the City Takeover Code, the offer document must be posted within 28 calendar days (20 event days) of the announcement of an intention to bid. In general the bid must be declared unconditional or defeat conceded within 60 calendar days (43 event days) of the posting of the offer document. This implies that from the announcement date the maximum length of time for the completion of a bid is 88 calendar days (63 event days).

Additionally offer terms cannot be revised after 45 calendar days (32 event days) from the posting of the offer

document. This implies that most of the information (ie, any revision of terms) associated with the bid will have been revealed by 73 calendar days (52 event days) from the announcement date. Since the majority of bids are friendly bids the time to completion is usually less than the maximum of 88 calendar days.

The average time to completion is 33 event days. By cumulating returns up to 40 event days after the announcement date, there is a reasonable probability of capturing any post announcement valuation effects of the bid.

Previous studies (Shih & Suk, 1992; Niendorf & Huffman, 1992; Holland & Hodgkinson, 1994) have shown that there is some information leakage prior to the announcement of the takeover. The CAR graph for the target (Figure 8.2) shows that the target's share price begins to rise as early as 25 days before the bid announcement date. In order to ensure that we have a reasonable probability of capturing any pre announcement information leakage we start cumulating the abnormal returns 40 days before the announcement date.

The F-statistic in Table A8.2 shows that the method of payment does have an impact on the average time taken to complete an acquisition. Table A8.3 reports statistical significance of the difference in means for the average time to completion for the different methods of payment. Offers with a cash component take significantly longer to complete than equity offers. This is contrary to the

Table A8.3

Pairwise comparison of the number of event days between the announcement date and the unconditional date for different methods of payment.

t-statistics are calculated assuming unequal group variances where the null hypothesis of equal group variances is rejected at the 10% level. Otherwise t-statistics are calculated assuming equal group variances.

	Cash or Equity	Cash & Equity	Equity Offer
Cash Offer	1.39	-0.29	2.49**
Cash or Equity		-1.90*	1.66*
Cash & Equity			3.10***

Notes:

1) ***, **, * Significant at 1%, 5%, 10% levels respectively.

2) Positive t-statistic implies that the mean for the payment method in the vertical column is higher.

evidence in the US, where cash offers were found to have a shorter time interval between the announcement and unconditional dates (Wansley, Lane & Yang, 1983).

CHAPTER 9.

SUMMARY, CONCLUSIONS AND IMPLICATIONS.

9.1. Introduction

As stated in Chapter 1, the broad objectives of this study were to examine the determinants of the method of payment in corporate acquisitions and its effects on shareholder wealth. In the light of these objectives we formulated (Section 1.4) three research questions:

- 1) What factors determine the method of payment used by bidders in corporate acquisitions?
- 2) How do target shareholders choose between cash or equity when the bidder has offered "equity with a cash alternative" as the method of payment?
- 3) Why are bid premia higher in cash offers than in equity offers?

We also wished to examine whether the method of payment and the choice of accounting policy were jointly and simultaneously determined. This implied that we would have to study the determinants of the accounting policy in corporate acquisitions.

In this chapter we summarise the results of our analyses as regards our objectives and discuss the implications of these results for investors, managers, financial advisers, policy makers, related parties and future research.

9.1. Determinants of the method of payment

In Chapters 4 and 5, we empirically examined the determinants of the method of payment, using both a simultaneous and single equations framework. From our models we were able to identify a number of variables which could explain the cross sectional variations in the types of payment currency used by bidders. In this regard, we consider that we have succeeded in our first objective of understanding the factors which explain the method of payment used in corporate acquisitions. We have been able to demonstrate that the choice of payment method in corporate acquisitions is not a random decision but one which is motivated by rational economic considerations.

Using a simultaneous equations model, we find that while the method of payment is a major determinant of the accounting policy, the reciprocal effect of accounting policy on the payment currency is not significant. With a single equation model both effects are significant. This result demonstrates the importance of recognising the simultaneity problem between the method of payment and the choice of accounting policy. Additionally this result suggests that for UK bidders, the primary decision variable is the financing method, not accounting policy.

The result that the choice of accounting policy does not influence the method of payment reflects the fact that the ability to write off goodwill against net assets and the availability of merger relief in the UK has eroded the distinction between acquisition and merger accounting. A

desirable characteristic for accounting rules is that they should not influence the substantive commercial or financing decisions of managers. We know that the method of payment affects the wealth of shareholders. It is therefore important that the accounting rules, which have no substantive cash flow implications, do not alter acquisition financing decisions which are based on economic fundamentals. On this accounting neutrality test our results show that UK accounting rules are presently effective.

In the UK, the Accounting Standards Board (ASB) is currently engaged in revising the accounting rules for business combinations and for the treatment of goodwill (ASB Discussion Paper issued in December 1993 "Goodwill and Intangible Assets"). Two possible alternatives have emerged:

- (1) capitalise and amortise over a predetermined life;
- (2) capitalise with annual review and only write off if there is a permanent decline in the value of goodwill.

Of these two proposals, the former with a regular charge to the income statement is more likely to undermine accounting neutrality if managers seek to avoid earnings dilution. Under the second proposal, such dilution is of less concern.

Our results also show that cash resources, free cash flow, the investment opportunity set, insider control, conditions in the capital markets and information asymmetry

all influence the choice of method of payment. These further results are robust to whether simultaneous or single equation framework is used and to sampling variations. The evidence that these variables affect the managerial preference on how to finance an investment indicates that these factors can be used to enhance the power of models which seek to explain the observed capital structure of the firm.

The result that managerial control of votes influences the acquisition financing decision can help managers and investors resolve some of the information asymmetry problem associated with seasoned equity offers. Given the potential cost to managers of losing control as a result of issuing new equity, the fact that a rights issue is undertaken by a firm with high managerial ownership could signal to the market that managers are not attempting to issue overvalued equity. The size of managerial control of votes can therefore act as a mechanism by which managers can signal that a new issue of equity is being driven by fundamentally sound economic decisions.

9.2. Determinants of the accounting policy

As an important by-product of studying the joint determination between the method of payment and the choice of accounting policy, we examined the determinants of managerial preference between merger and acquisition accounting. We were unable to develop a model which had sufficient power to discriminate between the users of

merger and acquisition accounting. The data seem to indicate that managers do not have strong preferences for any particular accounting method in the UK (see Table 5.3, where only 25% of bidders qualified to use merger accounting actually chose merger accounting). This evidence questions the relevance and usefulness of Financial Reporting Standard 6 (see Section 3.2.2).

The central objective of FRS 6 is to restrict the circumstances under which merger accounting is used in accounting for business combinations¹. FRS 6 appears to have been driven by a misguided belief that a large number of companies violated the spirit of SSAP 23 by using merger accounting in circumstances when its use was wholly inappropriate. It is certainly true that some companies who should have used merger accounting employed arrangements such as vendor rights (see Section 3.2.1) to ensure compliance with the SSAP 23 rules for using merger accounting. However considering that the majority of bidders who qualified to use merger accounting actually chose acquisition accounting and the fact that only 10% of all bidders used merger accounting, we must question the validity of the ASB's argument that the issue of FRS 6 is justified by the widespread concern that the SSAP 23 conditions were too readily circumvented². As there is very limited use of merger accounting the violations of SSAP 23 could not have been widespread. It is highly unlikely that

¹See paragraph 1 of FRS 6.

²See Financial Reporting Exposure Draft (FRED) 6.

the new rules contained in FRS 6 would lead to any significant reduction in the number of companies using merger accounting.

Managerial indifference between acquisition and merger accounting methods can be attributed to the fact that in the UK bidders are not compelled to amortise goodwill through the P&L account. The neutrality of accounting rules on financing decisions could be lost if writing off goodwill through the balance sheet reduces the bidder's net assets and causes a breach of loan covenants. We already have evidence in Chapter 5 that the size of potential goodwill to be written off has a weakly significant impact on the choice of accounting policy (see Sections 5.2.2 and 5.5). If the influence of goodwill on the choice of accounting policy is to be minimised then lenders should be encouraged to include goodwill written off on an acquisition in the calculation of net worth. Citron (1992b) found that 27% of loan agreements in his sample already included such a provision. Given the significant proportion (73%) of Citron's sample which did not provide for the inclusion of goodwill written off in the calculation of net worth, lenders need to be educated on the benefits of maintaining the neutrality of accounting rules, so that this practice becomes universal.

9.3. The choice of payment method by target shareholders

One of the issues confronting target shareholders in an equity offer is the valuation of the bidder's paper. A

cash offer has a known value which is established at the date of the acquisition, whereas, because shares are risky securities the value of the equity offer may be affected by the post merger performance of the merged firm. If the post merger performance of the merged firm is high (low) then the value of an equity offer will be high (low). Target shareholders face a dilemma in deciding whether to accept a cash offer which has a known value or an equity offer whose final value is subject to the uncertain future performance of the bidder. In Chapter 6 we examined two alternative perspectives on how target shareholders make decisions on whether to accept cash or equity as the method of payment.

The first perspective, based on the efficient market hypothesis (EMH), suggests that target shareholders should accept the present market price as a fair reflection of all publicly available information and that uncertainty about the post merger performance of the merged firm simply reflects the normal risks associated with investing in any security. Under this perspective, target shareholders should use the present market price of the bidder as the basis for valuing the equity offer. The choice by target shareholders between cash and equity should be based primarily on a comparison of the monetary values of the two offers.

The second perspective, which implies some form of mispricing of shares by the market, suggests the valuation of the bidder's equity offer is only determined ex post

over time as information about the post merger performance of the merged firm is revealed. Under this perspective, factors which influence the post merger performance of the merged firm, will influence the choice by target shareholders of whether to accept the cash or equity offer.

The empirical validity of the two perspectives was tested in Chapter 6 using a sample of 130 takeovers in which the bidder had offered "equity with a cash alternative" as the method of payment. The proportion of target shareholders accepting the equity offer was regressed on the difference in value between the equity and cash offers and proxies for the economic fundamentals of the acquisition. The EMH perspective predicts that while acceptance of the equity offer should be positively related to the difference in value between the equity and cash offers it should not be influenced by the economic fundamentals of the acquisition. The market mispricing perspective predicts that acceptance of the equity offer should be related to both the difference in value between the equity and cash offers and the economic fundamentals of the acquisition.

Our results show that target shareholders behave in a manner which is consistent with a belief in the EMH i.e, that investors believe that share prices are an accurate reflection of economic realities. Since this test of the efficiency of the stock market is not based on any predictions about the relevance of the capital asset pricing model (CAPM) this is evidence in favour of the EMH

which is not affected by the joint hypothesis problem³ which has weakened some of the previous tests of the EMH (Summers, 1986).

This has the practical implication that target shareholders can rely on market prices as the basis of valuing equity offers. This indicates that the valuation of equity offers is not as arduous or complex as the information asymmetry literature would suggest. Information signalling models (Fishman, 1989; Berkovitch & Narayanan, 1990) which suggest that the value of equity offers is determined ex-post are probably based on assumptions which do not reflect the beliefs of investors.

9.3.1. Difference in value between equity and cash offers

In Chapter 6, we examined the factors affecting the difference in value between equity offers and the associated cash alternative. This is an issue which has not been examined in any previous study. Consistent with the argument that during the offer period a put option giving target shareholders the right to sell their shares to the bidder is imbedded in a cash offer while in an equity offer the equivalent claim against the bidder is an "option to exchange" assets we found that the difference in value between an equity offer and the cash alternative is:

positively related to the standard deviation of the

³Previous tests which seek to show that trading rules cannot earn abnormal returns are jointly testing the hypothesis of no abnormal returns and the hypothesis that the control rate of return is correctly specified.

ratio of the bidder's share price to the target's share price and;

negatively related to the standard deviation of the target's share price.

These results have implications for the conduct and regulation of takeovers. Our results show that for both equity and cash offers, the target shareholders have valuable claims against the bidder. The City Code requires that bids must be left open for a minimum period of 21 days after the posting of the offer document. Additionally it is possible, dependent on the bidder's actions that a maximum period of 88 days can in general elapse between the announcement date and the unconditional date. The longer the period for which the offer is kept open, the more valuable are the options imbedded in the offer. Valuable options given to target shareholders by the bidder effectively represent part of the premium paid to acquire control (Margrabe, 1978). A long offer period increases the value of these options hence increasing the bid premium. The larger the bid premium paid to target shareholders the smaller the share of merger gains accruing to bidder shareholders. A long offer period could at the margin render an acquisition unprofitable for the bidder by increasing the costs of the bid. It is therefore important that in setting any minimum offer period both bidders and regulators should recognise this possible adverse effect associated with the length of the offer period.

9.4. Difference in bid premium between cash and equity offers

In Chapter 8, we tested some of the popular explanations which have been advanced in the literature to explain the widely observed higher returns to cash offers than equity offers. The capital gains tax compensation hypothesis and the wealth redistribution hypothesis were rejected.

We found that the method of payment does have an information signalling effect. The use of equity by firms whose managers the market believes have a high amount of private information is treated as bad news by the market. This is the first time that this effect has been documented in the literature. Additionally, the use of underwriters by bidders is ineffective as a method of signalling the quality of private information possessed by managers. This indicates that managers who wish to signal good news to the market should rely on the method of payment rather than the use of underwriters.

9.5. Issues for further research

In this study we have shown that it is possible to identify systematic factors which influence the method of payment used in corporate acquisitions. However in our analysis of the determinants of the method of payment, we have concentrated exclusively on the type of consideration offered to target shareholders. In the majority of acquisitions in our sample, the method of payment and the

method of financing are equivalent. In acquisitions where the method of payment is cash which is funded primarily from the bidder's own coffers, it is feasible that the cash offer may have been financed by a previous issue of shares or debt.

Since our results have already established that the liquidity of the bidder is an important determinant of the method of payment, a logical extension to the present study would be an investigation of the source of financing for cash offers. The results from such a study would complement the findings of this project and enrich our understanding of the factors which influence managerial preferences for particular methods of financing investments.

In our study of the determinants of accounting policy in corporate acquisitions we found that the use of merger accounting was negatively correlated with the bidder's gearing. This is a result which is inconsistent with the accepted theory and empirical evidence that high levels of gearing results in the choice of income increasing accounting policies. We observe that the existing literature on the relationship between gearing and the choice of accounting policy is based largely on US data. We suggest the possibility that the institutional relationships between lenders and borrowers in the UK may imply that managers of highly geared firms are constrained by lenders in their flexibility to choose income increasing accounting policies. While this explanation is plausible, it requires further scrutiny.

Our results show that in the UK, the possibility of writing off goodwill against reserves, the availability of merger reserve and the use of a dangling debit all combine to reduce managerial incentives for preference between merger and acquisition accounting. This result combined with the fact that about 60% (see Table 5.3) of takeovers do not qualify for using merger accounting, suggest that it might be worth exploring whether a viable project can be developed to examine if there are any economic incentives for managers choosing among goodwill write off to reserves, use of the merger reserve or the use of a dangling debit by bidders who do not qualify for the merger accounting method.

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